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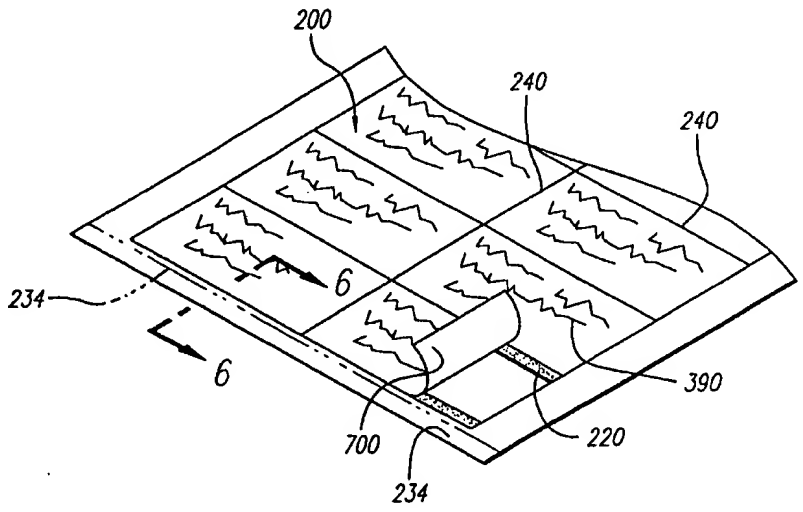

(57) Abstract

Ultraremovable adhesive (216) is applied to paper sheet (208) to form a liner sheet. The liner sheet is laminated to cardstock sheet (212) to form laminate cardstock (200). Sheet (212) is then die cut, but not the liner sheet, to form cut lines (240) that define at least in part perimeters of business cards or other printable media. The outer face of the liner sheet is then die cut, but not sheet (212), to form strips (304) on a back side of sheet (212). Some of strips (304) define cover strips covering some lines (240), and others define waste strips. The waste strips are removed. The resulting construction is then fed through a printer or copier. Indicia is printed on the front side of the cards while strips (304) hold the cards together. After printing, the cards are peeled off strips (304), ready for use.

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BUSINESS CARD SHEET CONSTRUCTION AND METHODS OF MAKING AND USING SAME

Background of the Invention

The present invention relates to printable sheet constructions which are adapted to be fed into printers or copiers and indicia printed on different portions thereof and the portions thereafter separated into separate printed media, such as business cards. It further is concerned with methods for making those printing sheet constructions. Additionally, it relates to methods of using the sheet constructions to form the printed cards.

Small size media, such as business cards, ROLODEX-type card file cards, party invitations and visitors cards, because of their small format, cannot be fed into and easily printed using today's ink jet printers, laser printers, photocopiers and other ordinary printing and typing machines. Therefore, one known method of producing small size media has been to print the desired indicia on different portions of a large sheet such as 8 1/2 by 11 or 8 1/2 by 14 or A4 size sheets, and then to cut the sheets with some type of cutting machine into the different portions or individual small size sheets or media with the printing on each of them. However, this method is disadvantageous because the user must have access to such a cutting machine, and the separate cutting step is cost and time inefficient.

To avoid this cutting step, another prior art product has the portions of the sheet which define the perimeters of the media (e.g., the business cards) formed by preformed perforation lines. (See, e.g., PCT International Publication No. WO 97/40979.) However, a problem with this product was that since these cards must be durable and professional looking, they had to be made from relatively thick and heavy paper. And the thick, heavy perforated sheets are relatively inflexible, such that they cannot be fed from a stack of such sheets using automatic paper feeders into the printers and copiers. One proposed solution to this feeding problem is disclosed in U.S. Patent 4,704,317 ('317) to Hickenbotham. (This

patent and all other patents and other publications mentioned anywhere in this disclosure are hereby incorporated by reference in their entireties.) The method of the '317 patent reduces the stiffness of the corners of the sheet as by scoring, slitting, die cutting or calendering. However, a number of problems with this method prevented it from becoming generally commercially acceptable.

Another attempted solution to the sheet feeding problem is that disclosed in U.S. Patent 5,571,587 ('587) to Bishop et al. (See also U.S. Patent 4,447,481 to Holmberg et al.) Pursuant to the '587 patent the sheetstock has a relatively thin portion on at least one of the longitudinal edges thereof which facilitates feeding the sheetstock into a printer or copier. The thin portion is removed from the sheet after printing. The individual printed cards are then separated from one another by pulling or tearing along the preformed microperforated lines. While the perforation ties remaining along the edges of the printed cards thereby formed are small, they are perceptible, giving the card a less than professional appearance and feel.

A card sheet construction which uses clean cut edges instead of the less desirable perforated edges is commercially available from Max Seidel and from Promaxx/"Paper Direct", and an example of this product is shown in the drawings by FIGS. 1-3. (See Canadian Patent Publication No. 2,148,553 (MTL Modern Technologies Lizenz GmbH); see also German DE.42.40.825.A1.) Referring to these drawing figures, the prior art product is shown generally at 100. It includes a sheetstock 102, divided by widthwise and lengthwise cut lines 104 in columns and rows of cards 110, surrounded by a perimeter frame 112. On the back side 114 of the sheetstock 102, thin carrier element strips 116 made of polyester are glued with adhesive 118 along and over the widthwise cut lines. These strips 116 hold the cards 110 and the frame 112 together when the sheetstock 102 is fed into a printer or copier as shown generally at 120. After the sheetstock 100 has been fed into the printer or copier 120 and the desired indicia printed on the cards 110, the cards are peeled off of and away from the strips 116 and frame 112. After all of the cards 110 have been so removed from the sheetstock 102, the left-over

material formed by the strips 116 and the frame 112 is discarded as waste material.

One of the problems with the prior art sheet product 100 is that printers have difficulty picking the sheets up, resulting in the sheets being misfed into the printers. In other words, it is difficult for the infeed rollers to pull the sheets past the separation tabs within the printers. Feeding difficulties are also caused by curl of the sheetstock 102 back onto itself . The "curl" causes the leading edge of the sheet to bend back and flex over the separation tabs. Since the sheetstock 102 is a relatively stiff product, it is difficult for the infeed rollers of the printer 120 to handle this problem.

Another problem with the prior art sheet 100 is a start-of-sheet, off-registration problem. In other words, the print is shifted up or down from its expected desired starting position below the top of the sheet. This off-registration problem is often related to the misfeeding problem discussed in the paragraph above. This is because if the printer is having difficulty picking up the sheet, the timing of the printer is effected. And this causes the print to begin at different places on the sheet, which is unacceptable to the users.

Summary of the Invention

Directed to remedying the problems in and overcoming the disadvantages of the prior art, disclosed herein is a dry laminated sheet construction including printable media, such as business cards, ROLODEX type cards, party invitations, visitor cards or the like. A first step in the formation of this dry laminated sheet construction is to extrusion coat a low density polyethylene (LPDE) layer on a densified bleached kraft paper liner, thereby forming a film-coated liner sheet. Using a layer of hot melt adhesive, a facestock sheet is adhered to the film side of the liner sheet to form a laminated sheet construction web. A more generic description of the "dry peel" materials -- the LPDE, and densified bleached kraft paper liner -- is a film forming polymer coated onto a liner stock. The facestock sheet, the film layer and the adhesive layer together define a laminate facestock.

(See U.S. Patent 4,863,772 (Cross); see also U.S. Patents 3,420,364 (Kennedy), 3,769,147 (Kamendat et al), 4,004,058 (Buros et al), 4,020,204 (Taylor et al), and 4,405,401 (Stahl)). The sheet construction (which also includes a facestock bonded to the film forming polymer) separates at the film-liner interface rather than the facestock-film interface, when the final construction is subjected to a peeling force.

According to one embodiment of this invention, a web of laminate facestock is calendered along one or both edges thereof to assist in subsequent printer feed of the printable media sheets. The calendered edges help prevent the multiple sheet feed-through, misfeed and registration problems of the prior art. Lines are die cut through the laminate facestock and to but not through the liner sheet. These facestock cut lines define the perimeters of blank business cards (or other printable media) and a surrounding waste paper frame. These die cut lines do not cause sheets to get caught in one another. This allows sheets to be effectively fed into printers. Lines are then cut through the liner sheet, but not through the laminate facestock, to form liner sheet strips on the back face of the laminate facestock. The liner sheet cut lines can each be straight lines or they can be curving, wavy lines. The lines can be horizontally (or vertically) straight across the sheet or diagonally positioned thereon. According to one alternative, the lines can extend only part way across the sheet, such as from both side edges, to only a central zone of the sheet. Further steps in the process are to sheet the web into individual sheets, stack and package them and distribute the packaged sheets through retail channels to end users.

The laminated (business card) sheets are unpackaged by the user and stacked into the feed tray of a printer or copier and individually and automatically fed, calendered edge first into a printer (and particularly a horizontal feed ink jet printer) or copier where indicia is printed on each of the printable media (or blank business cards) on the sheet. After the printing operation, each of the printed media (or business cards) is peeled off of the liner sheet strips and out from the waste paper frame. The support structure formed by the strips and the frame is

subsequently discarded. Alternatively, the support structure is peeled off of the printed business cards. The product, in either event, is a stack of cleanly printed business cards, each having clean die cut edges about its entire perimeter.

In other words, the adhesive layer securely bonds the facestock sheet to the LPDE film layer on the liner sheet. It bonds it such that the overall sheet construction separates or delaminates at the film-liner sheet interface, when the user peels the printed business cards and liner strips apart. That is, it does not separate at the facestock sheet interface. Additionally, the film-coated liner sheet does not significantly affect the flexibility of the sheet as it is fed through the printer. Rather, it is the thickness of the facestock which is the more significant factor. Thus, the facestock sheet needs to be carefully selected so as to not be so stiff that feeding or printing registration problems result.

Pursuant to some of the preferred embodiments of the invention, every other one of the strips is peeled off and removed from the sheet during the manufacturing process and before the sheet is fed into a printer or copier. The remaining strips cover a substantial number of the laminated facestock cut lines and extend onto the waste paper frame to hold the business card blanks and the sheet together as they are fed into and passed through the printer or copier. The remaining strips (and thus the facestock cut lines) preferably extend width-wise on the sheet or are perpendicular to the feed direction of the sheet to make the laminated sheet construction less stiff and more flexible as it passes into and through the printer or copier. By starting off with a single continuous liner sheet to form the strips, the final stripped product is flatter than the prior art products. Thus, it is less likely that the sheets will bow and snag together.

Other embodiments do not remove any of the strips before the sheet is fed into the printer or copier. In other words, the entire back side of the laminated facestock is covered by the liner sheet having a series of liner-sheet cut lines.

A further definition of the method of making this invention includes forming a roll of a web of dry laminate sheet construction comprising a liner sheet on a facestock sheet. The web is unwound under constant tension from the

web and the edges of the web are calendered. The facestock sheet of the unwound web is die cut without cutting the liner sheet to form perimeter outlines of the printable media (business cards). The liner sheet is then die cut, without cutting the facestock sheet, to form liner strips. Alternating ones of the interconnected liner strips are removed as a waste liner matrix and rolled onto a roll and disposed of. The web is then sheeted into eleven by eight-and-a-half inch sheets, for example, or eight-and-a-half by fourteen or in A4 dimensions; the sheets are stacked, and the stacked sheets are packaged. The user subsequently removes the stack of sheets from the packaging and positions the stack or a portion thereof in an infeed tray of a printer or copier for a printing operation on the printable media or individually feeds them into the printer or copier. After the printing operation, the printed media are separated from the rest of the sheet, as previously described.

Sheet constructions of this invention appear to work on the following ink jet printers: HP550C, HP660C, HP722C, HP870Cse, Canon BJC620, Canon BJC4100, Epson Stylus Color II and Epson Stylus Color 600.

Another advantage of the embodiments of the present invention wherein alternate strips of the liner are removed before the printing operation is that a memory curl is less likely to be imparted or induced in the business cards from the liner sheet. Memory curl occurs when the facestock is removed from a full liner sheet. The liner strips are better than liner sheets since they reduce the amount of memory curl that occurs during removal of the facestock.

A further embodiment of this invention has a strip of the laminated facestock stripped away at one end of the sheet to leave a strip of the liner sheet extending out beyond the end of laminated facestock. This liner strip defines a thin infeed edge especially well suited for feeding the sheets into vertical feed printers and appears to work better than calendering the infeed edge. The opposite (end) edge of the laminated facestock can also be stripped away to leave an exposed liner sheet strip. Alternatively, the opposite edge of the laminated facestock can be calendered. The calendered edge appears to work better for

feeding the sheets into horizontal feed printers. And instructions can be printed on the sheet (or on the packaging or on a packaging insert) instructing the user to orient the sheet so that the exposed liner strip defines the infeed end when a vertical feed printer is used and to orient the sheet so that the calendered edge defines the infeed end when a horizontal feed printer is used.

In fact, this inventive concept of the exposed liner strip at one end and the calendered edge at the other end can be used for other sheet constructions adapted for feeding into printers for a printing operation thereon. An example thereof is simply a face sheet adhered to a backing sheet. The backing sheet does not need to have cut lines or otherwise formed as strips. And the face sheet does not need to have cut lines; it can, for example, have perforated lines forming the perimeters of the business cards or other printable media.

A preferred sheet construction of the present invention is facially similar to but a significant improvement over the prior art "Paper Direct" product shown in FIGS. 1-3, and described in the Background of the Invention portion of this disclosure. In addition to the previously-discussed problems, that prior art product is too flimsy. Accordingly, a preferred sheet construction of the present invention uses paper strips, instead of polyester film strips, to hold the sheet together. The paper strips are stiffer and preferably wider (e.g., 9/16 inch wide) than the film strips, thereby giving the sheet construction a firmer, more intact, feel, which is commercially valuable. Additionally, the paper strips allow the sheet to lay flat, with less puckering along the die cut unions, since it reacts to the environment in a similar manner as the cardstock.

Similar to the dry laminate products of this invention described above a laminate cardstock is formed according to this preferred embodiment. Ultraremovable adhesive is applied to a paper sheet to form therewith a liner sheet and the liner sheet is laminated to a cardstock (facestock) sheet to form this laminate cardstock web. The web is face die cut through the cardstock sheet but not through the liner sheet to thereby form cardstock cut lines that define at least in part perimeters of the printable media (business cards, postcards, greeting

cards, and so forth). At the next station the web is then die cut through the liner sheet, but not through the cardstock sheet, to form liner sheet strips on a back side of the cardstock sheet. Some of the strips define cover strips covering backs of some of the cardstock cut lines, and others of the strips define waste strips. The waste strips are then matrix removed from the back of the cardstock sheet. The web is then sheeted into sheets of the desired size, such as 8 1/2 by 11 inches. The sheets are ready to be fed into a printer or copier, and a printing operation thereby conducted on fronts of the printable media. The printed media are then separated from (peeled off of) the cover strips, ready for use. The cover strips preferably provide the sole means of keeping the die cut printable media together as an intact unit sheet for passing through the printer or copier. Removing the waste strips before the sheet is passed through the printer or copier makes the sheet more flexible so that it can bend and pass better through the winding paths in the printers or copiers.

The ultraremovable adhesive is peeled off with the paper waste strips and the cover strips thereby providing a clean back side to the cardstock sheet (and thereby the printed media). The clean back side(s) (even when a coating thereon is provided) advantageously can be written on, that is, it accepts pencil, ink and even inkjet and laser printing. The ultraremovable adhesive sticks to the paper allowing for easy removal and disposal of the paper strips, and even though it is tacky it does not stick to anything permanently. In contrast, the "Paper Direct" product uses a removable adhesive. (Generally, adhesions of "ultraremovable" adhesives at their highest adhesion levels (to a surface such as stainless steel) are roughly half of what they are for conventional "removable" adhesive. A fundamental difference is that conventional adhesives provide complete contact with a substrate while ultraremovable provide partial contact. This limited contact area is what prevents an ultraremovable adhesive from becoming permanent, over time.)

To assist the sheet in being fed into the printer or copier the lead-in edge thereof is preferably calendered, unlike the "Paper Direct" product. The web,

before sheeting, is preferably calendered with textured calendering dies before the face cutting station. The calendering step is also preferably performed after the printing operation on the web wherein identifying and explanatory information is printed on the cardstock.

Other objects and advantages of the present invention will become more apparent to those persons having ordinary skill in the art to which the present invention pertains from the foregoing description taken in conjunction with the accompanying drawings.

Brief Description of the Drawings

FIG. 1 is a perspective view showing a prior art sheet construction being fed into a printer or copier;

FIG. 2 is a perspective view of an end of the prior art sheet construction of FIG. 1 showing a sheet portion or card being removed therefrom;

FIG. 3 is an enlarged cross-sectional view taken on line 3-3 of FIG. 2;

FIG. 4 is a perspective view showing a laminated sheet construction of the present invention being fed into a printer or copier and a laminated sheet construction of the present invention after a printing operation has been performed thereon by the printer or copier;

FIG. 5 is a view similar to that of FIG. 2 but of a first laminated sheet construction of the present invention, such as is shown in FIG. 4;

FIG. 6 is an enlarged cross-sectional view taken on line 6-6 of FIG. 5;

FIG. 7 is a plan view of the back of the first laminated sheet construction of FIG. 5;

FIG. 8 is a plan view of the front of the first laminated sheet construction of FIG. 7;

FIG. 9 is an enlarged cross-sectional view taken on line 9-9 of FIG. 8;

FIG. 9A is a view similar to FIG. 9 and illustrates a portion of a first alternative construction;

FIG. 9B illustrates a portion of a second alternative construction;

FIG. 10 is a view similar to FIG. 7;

FIG. 11 is a view similar to FIG. 8;

FIG. 12 is a perspective view showing a stack of laminated sheet constructions of the present invention operatively positioned in an automatic feed tray of a printer or copier waiting to be individually fed therein for a printing operation and a sheet from the stack having already been printed;

FIG. 13 is a view similar to FIG. 7 but of a second laminated sheet construction of the present invention;

FIG. 14 is a view similar to FIG. 13;

FIG. 15 is a back view of a third laminated sheet construction of the present invention;

FIG. 16 is a view similar to FIG. 15;

FIG. 17 is a back view of a fourth laminated sheet construction of the present invention;

FIG. 18 is a view similar to FIG. 17 and of the fourth laminated sheet construction;

FIG. 19 is a back view of a fifth laminated sheet construction of the present invention;

FIG. 19A is a back view of sixth laminated sheet construction of the present invention;

FIG. 20 is a back view of a seventh laminated sheet construction of the present invention;

FIG. 21 is a back view of an eighth laminated sheet construction of the present invention;

FIG. 22 shows the dimensions of the strips of FIG. 21;

FIG. 23 is an enlarged cross-sectional view taken on line 23-23 of FIG. 21;

FIG. 24 is a view similar to FIG. 23, but showing a ninth laminated sheet construction of the present invention;

FIG. 25 is a schematic view showing a process and system of making the sheet constructions of FIGS. 21 and 26;

FIG. 26 is a view similar to FIG. 23, but showing a tenth laminated sheet construction of the present invention;

FIG. 27 is a front view of an eleventh laminated sheet construction of the present invention;

FIG. 28 is an enlarged cross-sectional view taken on line 28-28 of FIG. 27; and

FIGS. 29A and 29B are front and back views, respectively, of a first version of a preferred business card sheet construction of the present invention;

FIGS. 30A and 30B are front and back views, respectively, of a second version business card sheet construction;

FIGS. 31A and 31B are front and back views, respectively, of a first version greeting card sheet construction of the present invention;

FIGS. 32A and 32B are front and back views of a second version greeting card sheet construction;

FIGS. 33A and 33B are front and back views of a third version;

FIGS. 34A and 34B are front and back views of a fourth version;

FIGS. 35A and 35B are front and back views, respectively, of a first version postcard sheet construction of the present invention:

FIGS. 36A and 36B are front and back views, respectively, of a second version postcard sheet construction;

FIG. 37 is an enlarged cross-sectional view taken through one or more of the sheet constructions of FIGS. 29-36; and

FIG. 38 shows a process for making one or more of the sheet constructions of FIGS. 29-36.

Detailed Description of Preferred Embodiments of the Invention

A number of different embodiments and manufacturing processes of the dry laminated business card sheet constructions of this invention are illustrated in

the drawings and described in detail herein. A representative or first sheet construction is illustrated generally at 200 in FIGS. 5, 6 and 7, for example.

Referring to FIG. 4, sheet construction 200 is formed by extrusion coating a low density polyethylene (LDPE) layer 204 onto a densified bleached kraft paper liner sheet (or base paper or base material) 208, which is not siliconized. The thin extrusion-cast LDPE layer 204 is unoriented. A suitable liner sheet 208 with layer 204 is available from Schoeller Technical Papers of Pulaski, New York. The extrusion-coated liner sheet is laminated to a facestock sheet (or card stock) 212 using a layer of hot melt pressure sensitive adhesive (PSA) 216. The facestock sheet 212, the adhesive layer 216 and the film 204 form a laminate facestock 220. The facestock sheet 212 can be current ink jet business card stock available from the Monadnock paper mills and which has good printability and whiteness. The adhesive of layer 216 can be a conventional hot melt adhesive such as H2187-01 hot melt adhesive available from Ato Findlay, Inc. of Wauwatusa, Wisconsin, or hot melt rubber-resin adhesive compositions of the type taught in U.S. Patent 3,239,478 (Harlan, Jr.). The requirements for the hot melt PSA are not very demanding. The PSA layer 216 need only secure the facestock sheet 212 to the LDPE layer 204 of the dry release base material or liner sheet 208, such that the overall dry laminate facestock construction 224 delaminates at the LDPE-liner sheet interface when a user seeks to peel away the liner, and not at a surface of the facestock sheet 212.

A preferred example of this dry laminate facestock construction 224 is the "Dry Tag" product such as manufactured at the Fasson Roll Division of Avery Dennison Corporation. The facestock sheet 212 can alternatively be fluorescent paper, high gloss paper or thermal transfer label paper. A preferred high photo glossy paper which can be used is the glossy cardstock which is available from Rexam Graphics of Portland, Oregon and has a thickness of approximately eight mil.

Preferred thicknesses of each of the layers of the laminate facestock construction 224 are as follows: the liner sheet 208 -- 3.0 mil; the LDPE film

layer 204 -- .80 to 1.0 mil; the adhesive layer 216 -- .60 to .75 mil; and the facestock sheet 212 -- 8.3 or 8.5 to 9.0 mil. Alternatively, the liner sheet 208 plus the film layer 204 can have a 3.5 mil thickness. Another alternative is for the thicknesses of the facestock sheet 212 and the liner sheet 208 to be approximately 6.0 and 3.0 mil, respectively, or approximately 7.0 and 2.0 mil, respectively. The LDPE layer 204 will not significantly affect the flexibility of the sheet construction; rather, it is the thickness of the facestock 212 which is the more significant factor. To assist the picking up and feeding of the laminate facestock construction 224 into the printer or copier 230, the leading edge 234 can be, according to one definition of this invention, calendered or crushed, as shown in FIG. 6. More particularly, a 7/16 inch wide portion of the leading edge 234 can be crushed with a calendering die to reduce the caliper from thirteen mil to ten mil, for example.

In addition to calendering the leading edge 234 of the laminate facestock construction 224, further processing steps are needed to form the sheet construction 200. One key step is to form cut lines 240 on and through the laminate facestock. Referring to FIGS. 8 and 11, the cut lines 240 include frame cut lines 244 and grid cut lines 248, and the frame cut lines include side cut lines 252 and end cut lines 256. The frame cut lines 244 define a border or frame 260 around the central area 264 of the sheet. And the grid cut lines 240 form a grid of spaced horizontal and vertical cut lines 270, 274 in the central area 264. Thereby, the grid cut lines 248 and the frame cut lines 244 form the perimeters of rectangular media 280, such as business cards. FIG. 8 shows that a preferred number of the rectangular media 280 is ten, aligned in two columns of five each and surrounded by the frame 260. FIG. 11 shows that preferred dimensions 284, 288, 292, 296 and 298 are 1/2, 3 1/2, 11/32, 3/8 and 2 inches, respectively.

The facestock cut lines 240 extend through the laminate facestock construction 224 and to but not through the liner sheet 208. If the facestock cut lines 240 passed through the liner sheet 208, the laminate facestock construction 224 would fall apart into the rectangular media 280 and the frame 260, each

separate from the other. The separate small media cannot be passed effectively through the printer or copier 230 for a printing operation on them. Instead, the facestock cut lines 240 do not pass through the liner sheet 208. However, the continuous liner sheet 208, while it would hold the (ten) rectangular media 280 and the frame 260 together during the printing operation, may make the sheet construction 200 too rigid, lacking the flexibility to pass through the curving feed paths in printers or copiers. In some of the figures which show the back or liner face of the sheet construction, the facestock cut lines 240 are shown in dotted lines to depict their relationship with the liner sheet strips as discussed below. Although the facestock cut lines 240 and the liner-sheet cut lines discussed below are preferably formed by die cutting, other techniques such as laser cutting or using a circular cutting blade as would be known by those skilled in the art are within the scope of this invention.

Therefore, pursuant to the present invention, liner-sheet cut lines 300 are formed on the liner sheet 208, through the liner sheet and to but not through the laminate facestock 224. They divide the liner sheet 208 into liner strips 304. The liner-sheet cut lines 300 provide flexibility to the sheet construction 200 and according to some of the embodiments of this invention, adequate flexibility. However, for others the flexibility is not enough, so these embodiments provide that some of the strips are removed from the laminate facestock 224 to form the sheet construction which is passed through the printer or copier 230. More importantly, by removing some of the liner strips, the amount of memory curl induced in the (printed) media is reduced. The remaining strips 308, however, must be sufficient to hold the cut laminate facestock 224 together during the printing operation. In other words, the shape and location of the remaining strips 308 are selected on the one hand to provide sufficient sheet flexibility and to minimize memory curl and on the other hand to provide sufficient sheet integrity. In particular, according to preferred embodiments, the remaining strips cover all of the facestock cut lines 240 which are parallel to the infeed edge of the sheet.

Where the sheet is to be fed in the portrait direction into the printer or copier 230, the covered facestock cut lines extend width-wise on the sheets.

The embodiment of FIG. 7 shows the remaining strips 308, 340 being relatively thin, but still covering and overlapping the horizontal facestock cut lines. FIG. 10 gives the dimensions of the sheet construction 200 and the remaining strips 308. Dimensions 312, 316, 320, 324 and 328 are 7/8, 3/4, 1 1/4, 8 1/2 and 11.00 inches, respectively. In contrast, the remaining strips 340 in the sheet construction as shown generally at 350 in FIG. 13 are wider. The dimensions of the strips and sheet are shown in FIG. 14 by dimensions 354, 358, 362, 366 and 370, as being 1 1/4, 1/2, 1 1/2, 8 1/2 and 11.00 inches, respectively.

FIGS. 9A and 9B are enlarged cross-sectional views of first and second alternative sheet constructions of this invention. They are alternatives to the LDPE/densified bleached kraft paper component of FIG. 9, for example. The relative thicknesses of the layers are not represented in these drawings. Alternative construction shown generally at 372 in FIG. 9A uses vinyl or another cast film on its casting sheet. Referring to FIG. 9A, the tag facestock or other paper sheet is shown by reference numeral 374a. The PSA layer, vinyl or cast film, and the casting sheet are labeled with reference numerals, 374b, 374c and 374d, respectively. Reference numerals 375a and 375b depict the facestock cut lines and liner cut lines. Similarly, the second alternative shown generally at 376 in FIG. 9B includes tag facestock or other face paper 377a, PSA layer 377b, film #1 377c, film #2 377d and liner 377e. The facestock and die cut lines are shown by reference numerals 378a and 378b, respectively.

While sheet constructions 200, 350 show the liner-sheet cut lines and thus strips 308, 340 extending straight across the sheet, sheet construction 380 has its liner-sheet cut lines 384 extending diagonally across the back of the laminate facestock. This construction is shown in FIG. 15, and FIG. 16 shows dimensions 390, 392, 394 and 398, which can be 1, 2, 1/2, and 1 1/2 inches, respectively. Sheet construction 380 includes all of the diagonal liner strips 388 still positioned on the laminate facestock during a printing operation. However, it is also within

the scope of the invention to remove (unpeel) one or more of the strips before the printing operation. One arrangement would remove alternating ones of the diagonal strips. However, it may be that the remaining (diagonal) strips do not provide the sheet with sufficient integrity to prevent bowing of the sheet on the facestock cut lines.

The liner-sheet cut lines 300, 384 are discussed above and as shown in the corresponding drawing figures are all straight lines. However, it is also within the scope of the invention to make them curving or wavy, and a sheet construction embodiment having wavy or curving lines 412 is illustrated generally at 416 in FIG. 17. It is seen therein that the liner-sheet cut lines 412 on opposite sides of the strips 420 thereby formed have opposite or mirror images. Referring to FIG. 18, preferred dimensions 424, 428, 432, 436, 440 and 442 are 27/32, 1, 1 11/32, 3 1/2, 3/4 and 8 1/2 inches, respectively. The sheet construction embodiment 416 is fed into the printer or copier 230 in the condition as illustrated in FIG. 17, that is, none of the liner strips has been removed. A variation thereon is illustrated by the sheet construction shown generally at 450 in FIG. 19 wherein alternating ones of the strips (five eye-goggle shaped strips) have been removed exposing the back surface of the facestock laminate as shown at 454.

It is also within the scope of the present invention for the liner-sheet cut lines and thus the liner strips to not extend from one side or edge of the sheet to the other. A sheet construction embodying such a configuration is shown in FIG. 19A generally at 455. Essentially the only difference between sheet construction 455 in FIG. 19A and sheet construction 450 in FIG. 19 is that the wavy liner-sheet cut lines 456 do not extend from one side of the sheet to the other. Rather, they stop near the center of the liner sheet and short connector lines 457a, 457b form pairs of oppositely-facing fish-shaped strips, which when removed expose pairs of oppositely-facing fish-shaped portions 458a, 458b of the laminate facestock. (For straight liner-sheet cut lines, instead of wavy cut lines, the exposed shapes would be rectangles instead of fish shapes.) Strips 459 of the

liner sheet remain between the adjacent pairs of connector lines 457a, 457b. The strips 459 cover portions of the central vertical facestock cut lines and thereby help to maintain the integrity of the sheet construction.

Flexibility of the sheet constructions at both ends thereof is important. Accordingly, referring to FIG. 20, flexibility cut lines 460 are formed in the end liner strips 462 extending the full width of the strips in the sheet construction embodiment shown generally at 464 and which is similar to the wide strip embodiment of FIG. 13. The dotted lines in that figure show the locations of the facestock cut lines 240 in the laminate facestock 220 and are included in the figure to illustrate the relative positioning of the liner-sheet cut lines 300 (and the strips thereby formed) and the facestock cut lines 240. As can be seen the flexibility cut lines 460 are positioned between the ends of the sheet construction and the adjacent end frame cut lines 256. This provides flexibility to the end portions of the waste frame 260. The flexibility cut lines 460 are preferably formed in the same operation (die cutting) as the liner-sheet cut lines 300. So another way to view the flexibility cut lines 460 is that they are simply liner-sheet cut lines at the ends of the liner sheet 208 where the adjacent strips thereby formed are not removed. The thin liner strips are removed from locations 474 in the illustrated embodiment. And the remaining wide strips 478 are positioned over, covering and overlapping each of the facestock horizontal grid cut lines.

A preferred embodiment of the liner sheet or the liner-sheet cut lines 300 and liner strips is illustrated by sheet construction shown generally at 482 in FIG. 21. Referring thereto, it is seen that the liner-sheet cut lines form three different types of strips, namely, (two) end wide strips 486, (four) central wide strips 490 and (ten) thin strips 494. The end wide strips 486 are provided at both ends of the sheet and extend the full width of the sheet and along the entire edge thereof. Flexibility cut lines 496 are provided in each of the end wide strips 486, positioned similar to those in the FIG. 19 embodiment. The central wide strips 490 cover each of the horizontal facestock grid cut lines. They are not quite as wide as the corresponding strips in FIG. 19. Thus, more of the frame vertical

facestock cut lines are exposed on the liner side of the sheet. This can result in them bowing out and snagging as the sheet winds its way through the printer or copier 230.

Accordingly, the sheet construction 482 of FIG. 21 provides for thin strips 494 positioned between and parallel to the wide strips 486, 490. These thin strips 494 cross over each of the vertical facestock cut lines and thereby prevent the potential bowing out problem. Two of the thin strips are provided between each of the neighboring wide strips. Of course, it is within the scope of the invention to provide for only one thin strip between the neighboring wide strips or to provide for more than two thin strips, or to make them the same width as the wide strips or to eliminate them altogether. The central wide strips 490 and the thin strips 494 all have rounded corners 500, 504.

Each of the thin strips 494 and each of the central wide strips 490 extend a distance past the vertical frame cut lines, but not to the edge of the sheet. In other words, a liner edge or margin is left on both sides extending between the end wide strips 486. What this means is that the liner sheet "strips" which are removed after the liner-sheet cut lines are made and before the sheet construction is sent to the user for a printing operation are interconnected into a web or matrix. That is, all of the liner portions (or strips) between the thin strips 494 and the adjacent wide strips 486, 490 and between the adjacent thin strips are connected to the borders or margins and thereby to each other in a continuous web or matrix. Thus, by grabbing any portion of this matrix, and preferably a corner thereof, the entire matrix can be pulled off of the laminate facestock in essentially one step. As will be described with reference to FIG. 25, each of the matrices of the sheet construction web is wound onto a roll and the roll subsequently discarded. This is easier, faster, quicker and cheaper than pulling a number of individual liner waste strips off of the laminate facestock as is done when the strips are not interconnected. The dimensions of the strips and their spacings as shown by dimensions 512, 516, 520, 524, 528 and 532 in FIG. 22 are 8 1/2, 8, 1/4, 1/4, 3/4 and 1/8 inches, respectively.

Both end edges are crushed or calendered as can be seen in FIG. 23 at 536, preferably on the facestock side, but in the waste frame portion and not extending into the central area on the printable media. Alternatively and referring to the sheet construction as shown generally at 538 in FIG. 24, both sides can be crushed or calendered or only the liner sheet side as shown at 540.

A schematic view of the system and process for manufacturing the laminate sheet construction 482 of FIG. 21 is illustrated in FIG. 25 generally at 550. Each of the successive steps or stations is illustrated from left to right in that drawing figure. As shown, a web 554 of the dry laminate facestock formed as described previously and rolled on a roll 558 is delivered from the Avery Dennison Fasson Division, for example, to the press facility, such as a Webtron (Canada) Model 1618 press. At the press facility, the roll 558 is unwound with the facestock side up and the liner side down and is delivered to the printing station shown generally at 562, and which includes a print cylinder 566, an anilox roll 570 and an ink supply 574. At the printing station 562, desired identifying and informational indicia are printed on the facestock of the laminate such as on the frame portion. This indicia can include product code identification, the manufacturer's or distributor's name and logo, and patent numbers, if any.

The web 554 is then pulled to the turning station shown generally at 580 where a turn bar 584 turns the web over so that the liner side is facing up and the facestock side is facing down for delivery to the calendering station. At the calendering station shown generally at 588 and including an anvil 592 and a calendering die 596, both edges of the web on the facestock side thereof are crushed for about 7/16 inch from a 13.4 mil thickness to approximately 10.4 mil.

The web 554 is pulled further to the two die cutting stations. The face cutting station shown generally at 600 includes an anvil 604 and a face cutting die 608, with the anvil positioned on top. At this station the face of the web 554 is cut up to the liner but without cutting the liner to create the business card shapes on the face with cut lines, as previously described. At the liner cutting station as shown generally at 620, the anvil 624 is positioned below the liner cut die 628, in

a relative arrangement opposite to that at the face cutting station 600. The liner at this station 620 is die cut up to the face without cutting the face. At these die cutting stations 600, 620 a bridge bears down on the die bearers, which forces the die blades to cut into a predetermined portion of the caliper or thickness of the web. This portion is called a step, and is the difference between the bearer and the end of the die cutting blades. The smaller the step, the deeper the cut into the web, as would be understood by those skilled in the die cutting art.

The liner cutting forms the waste matrix 640 of the liner sheet. This matrix 640 is grabbed and pulled off of the web 554 and wound onto a roll 644 at the waste matrix station, which is shown generally at 648. The finished web 652 is thereby formed and delivered to the sheeting station. The calendering station 588, the face cutting station 600, the liner cutting station 620 and the waste matrix station 648 can essentially be arranged in any order except that the waste matrix station must follow the liner cutting station.

The sheeting station which is shown generally at 660 includes an anvil 664 and a sheeter cylinder 668. The eleven-inch wide web 652 is sheeted into eight-and-a-half inch sheets 672. Of course, if different sizes of sheets 672 (or 482) are desired (such as 8 1/2 by 14 inch or A4 size) then the width of the web and/or the sheeting distance can be altered or selected as needed. The final sheet constructions 672 (or 482) are shown stacked in a stack 680 at the stacking station, which is illustrated generally at 684. Each stack 680 of sheets can then be packaged and distributed to the end user through normal retail distribution channels.

The end user then unpackages the sheets and stacks them in a stack 686 in the infeed tray 694 of a printer (particularly an ink jet printer) or copier 230, such as shown in FIG. 12. (FIG. 12 shows sheet construction 200 and not 482.) The sheet construction 482 has tested well in ten sheet stack (684) automatic feeding tests in the following printers: HP DH 550/660C, Canon BJC 4100, Canon BJC 620, Epson Stylus Color 600 and Epson Stylus Color II. The printer or copier 230 preferably should not have temperatures above the melting point of the

LDPE used in the sheet construction. During the printing operation by these printers 230, the desired indicia 690 is printed on each of the printable media or cards. This indicia 690 can include the user's (or card owner's) name, title, company, address, phone number, facsimile number, and/or e-mail address, as desired. The printed sheet constructions are shown in the outfeed tray 694 of the printer 230 in FIGS. 4 and 12. FIG. 4 shows an individual manual feed of the sheet constructions.

The individual printed media or business cards 700 are then peeled off of the rest of the sheet construction in an operation as shown in FIG. 5, for example. The remaining laminate facestock frame and liner strip product is disposed of. The result is a stack of neatly and accurately printed business cards 700. Each of the cards 700 has clean die cut edges defining its entire perimeter. The cards 700 were efficiently and quickly printed by the process(es) of this invention, since the sheet constructions can be stacked in the infeed tray and automatically fed into and through the printer 230, unlike the prior art.

A further preferred embodiment of the present invention is shown generally at 710 in FIG. 26. Sheet construction 710 is similar to sheet construction 482 except at one end of the sheet -- the top end as shown in FIG. 26. Referring thereto, the laminate facestock 220 (and/or the liner sheet 208) is not calendered to make the end edge of sheet construction 710 thinner and thereby easier to efficiently feed into the printer or copier. Instead a one-half inch strip of the laminate facestock 220 is stripped off of the liner sheet leaving only a thin infeed liner strip 714 at that end of the sheet construction. The infeed liner strip 714 is well suited for vertical feed printers because it allows the sheet to easily curve under the infeed roller(s). And the opposite calendered end is well suited for feeding into horizontal feed printers because of the straight path the sheet(s) take(s) to engage the infeed roller(s). Indicia can be printed on the (front) frame of the laminate facestock 224 instructing the user as to which end of the sheet construction 710 defines the infeed end for vertical feed printers and for

horizontal feed printers. A preferred embodiment of sheet construction 710 removes the end liner strip 716 defined by line 496.

Two alternative systems or method for stripping the laminate facestock strip are illustrated in FIG. 25. For both embodiments only one edge is crushed at the calendering station 588. According to one, the laminate facestock is die cut by die 720 (and anvil 722) along die cut line 724 (FIGS. 26-28) at the stripping station shown generally at 728 and the strip removed from the web as shown by arrow 732. (Alternatively, the facestock can be on top of the web for this step.) The die cut line 724 can be the same as the top frame cut line so that there is no "frame" along the top. The stripped web is then wound back onto a roll (558) and placed into position on the facility 588 as denoted by arrow 736. The stripped roll is placed back on the press prior to station 562, in the same place as 558, as shown in FIG. 25.

The other method or system does not use the separate stripping station 728. Instead the stripping is conducted in the facility 550. The die cut line 724 is made at the face cutting station 600. The facestock strip is then removed at the removal station shown generally at 740, which can be part of waste matrix station 648. At removal station 740, the face strip 744 is wrapped around a driven roll 748 and exhausted using an air line 752 into a vacuum system.

The arrangement of having one end of a sheet construction formed by stripping a strip (744) of a face sheet (such as laminate facestock) off of a backing sheet (such as a liner sheet) can be used not only on sheet construction 710 and the other previously-described sheet constructions but also on generally any multi-sheet construction.

An example thereof is the sheet construction shown generally at 780 in FIGS. 27 and 28. Referring thereto, the laminate facestock construction is the same as that of FIG. 26, for example. It similarly has the face cut lines 240, the strip cut line 724, and the calendered end 536. However, the liner 212 is a solid sheet with no cut lines or strips formed or removed. Instead of a dry laminate construction, it can be simply a face sheet adhered directly to a backing sheet

with adhesive. And the facesheet separation lines (240) instead of being die cut can be microperfed. It still has the advantage of an efficient feed into a vertical feed printer using one end of the construction as the infeed end and using the other for efficient feed into a horizontal feed printer.

A preferred laminate sheet construction of the present invention is illustrated in FIGS. 29A and 29B generally at 800 and is a significant improvement over the previously-discussed "Paper Direct" prior art product; it represents a first version business card sheet construction of the inventions. A second version business card sheet construction is shown generally at 804 in FIGS. 30A and 30B. The invention can also be readily adapted to applications (printable media) other than business cards, such as greeting cards and post cards. First, second, third and fourth versions of greeting card sheet constructions of the present invention are shown generally at 808, 812, 816 and 820 in FIGS. 31, 32, 33 and 34, respectively. (The "A" and "B" designations for each of FIGS. 29-36 refer to the views of the front and back sides of each of the respective sheet constructions.) Similarly, first and second versions of a post card sheet construction of the invention are shown generally at 824 and 828 in FIGS. 35 and 36. The machine direction is designated by arrow 830. And a cross-sectional view of one or more of the sheet constructions of FIGS. 29-36 is shown generally at 832 in FIG. 37. Variations and alternatives of this cross-sectional view will be discussed later.

What all of the sheet constructions of FIGS. 29-36 have in common are a facestock sheet 836, through-cut lines 840 defining at least in substantial part the perimeters of printable media, and liner strips 844 on the back of the sheet covering many of the through-cut lines and holding the sheet together as a sheet construction unit for passage through a copier or printer. The facestock sheet 836 is preferably a cardstock sheet. Referring to FIG. 37, the liner strips 844 are preferably paper strips adhered to the facestock sheet with ultraremovable adhesive 848. The ultraremovable adhesive 848 can be the Fasson water-base acrylic suspension polymer (made per U.S. Patent 5,656,705) or the CleanTac II

adhesive available from Moore. As an example, the liner strips 844 can be 50# pre-primed uncoated litho paper (white or canary).

The cardstock sheet 836 may have or include a face coat 852 (FIG. 37), and the face coat can be a laser color-optimized coating or an ink jet color-optimized coating. The ink jet coating, for example, is a color optimized coating provided to enhance the appearance and waterfastness of ink jet inks on selected substrates (cardstocks). The cardstock sheet 836 may also have or include an adhesive-receptive back coat 856. A liner primer coat 860, such as the polyvinyl alcohol based primer with silicate available from Fasson or a primer available from Moore, may also be provided, sandwiched between the layer of adhesive 848 layer and the paper liner or strips 844.

Examples of usable cardstocks 836 are: (1) ink jet (uncoated) (a) Monadnock Paper Mills: 65# Cover (white, mellow white and antique gray) and (b) Monadnock Paper Mills: 100# Text (white, mellow white and antique gray); (2) ink jet (coated) (a) Monadnock Paper Mills: Lightweight C1S (white, mellow white and antique gray), (b) Monadnock Paper Mills: Heavyweight C1S (white, mellow white and antique gray), and (c) Mitsubishi Paper Mills: C1S Glossy (white); (3) laser (uncoated) (a) Fox River Paper Co.: 100# Text (white, natural and cool gray), and (b) Boise Cascade: 100# Offset (white); and (4) laser (coated) (a) Monadnock Paper Mills: C1S w/"Nairobi" or "Harmony" coating (white), and (b) Nakagawa: C1S Magnetic substrate.

Referring to FIG. 37, examples of cross-sectional thicknesses from top to bottom through the sheet construction are: cardstock face coat 852 (approximately 1.0 mil), cardstock 836 (approximately 7.0-9.2 mils), cardstock back coat 856 (approximately .1 mil), adhesive layer 848 (approximately .20-.25 mil), liner primer coat 860 (approximately .1-.5 mil), and liner sheet 844 (approximately 2.8-4.0 mils).

To assist the sheet construction in being consistently and accurately picked up and fed into the printer or copier, the infeed edge (and the opposite end) of the sheet construction can be calendered or crushed, as shown in various

of the drawing figures at 864. More particularly, the thickness of the infeed end of the sheet (or the laminate web 870 during the manufacturing process -- see FIG. 38 and discussions thereof to follow) is reduced by fifteen to twenty-five percent. The calendering can be just of the cardstock 836 and/or the cardstock and the paper liner or strip 844. Alternatively, the paper strip 844 nearest the infeed edge of the sheet construction can be parallel to and spaced and small distance (e.g. one-quarter inch) from the infeed edge of the cardstock, as shown in various figures by reference numeral 872. This reduces the thickness of the infeed end of the sheet construction. Additionally, the uncovered or exposed (one-quarter inch) infeed edge 872 of the cardstock 836 can be calendered, if desired, to further reduce the thickness of the infeed end.

The process(es) for making the sheet constructions of FIGS. 29-36 are similar to the process(es) previously above for making the dry laminate sheet constructions of this invention. They are illustrated schematically in FIG. 38. And referring thereto, the laminate roll 874 (which includes the cardstock 836 laminated to the paper liner 844 with the ultraremovable adhesive 848) is at the roll unwind station 880. One way to form the roll 874 is to at a first site apply the adhesive to the paper and wind it upon itself and then deliver it to a second site where it is laminated to the cardstock to form the roll. Another way to form the roll is for the cardstock to be delivered from the second site to the first where it is laminated and wound, and the roll then delivered to the second site. The roll 874 is unwound with the face side of the web 870 up and the liner side of the web facing down. The web 870 in this orientation passes to the printing station 884 where the printing rollers 888, 892 print the desired indicia (not shown) on the face side of the web (e.g., the cardstock face coat). The indicia can include the distributor's or manufacturer's name and/or logo, product code number, patent number(s), printer feeding directions and so forth.

The printed web 870 then passes to the web turning assembly 896, which flips the web over so that the liner side 870a of the web is up and the face side 870b is down. The calendering station 900 is next, and it includes an anvil roll

904 and a calendering die 908 which calenders the "infeed" edge of the web. The calendering dies 908 preferably have a random-patterned textured finish. As opposed to a smooth tool, the textured dies 908 grip the web 870 and keep it flat and even during the calendering process. The textured calendered end (864) also assists the printer's rollers to grip the sheet construction for infeeding same.

The web 870 then passes to the face cutting station 916, which includes an anvil roll 920 and a face cutting die 924, and the through-cut lines 840 in the facestock sheet 836 (but not passing into the liner 844) are formed at this station to define perimeters of the printable media (e.g., business cards, greeting cards, post cards, etc.). The liner cutting station 930, which includes the liner cutting die 934 and anvil roller 936, is the next station in this manufacturing process. At this station 930 the continuous liner sheet portion of the web 870 is die cut to form alternating cover strips 844 and waste strips 938 on the back of the cardstock sheet 836. The cover strips 844 cover the horizontal cardstock sheet die-cut lines, that is, the through-cut lines 840, which are width-wise parallel to the infeed edge of the cardstock sheet 836. The waste strips 938 are between the cover strips 844. The (separate) paper waste strips 938 are removed (pulled off) at the removal station 942, which can include a matrix rewind mandrel 946. Alternatively, the waste strips 938 can be removed from the web by a blower system.

The web 870 then passes to the sheeter station 950 where the web is cut or sheeted to the desired (width) dimension, such as 8.5 by eleven inch sheets as shown by a stack of same at 954. The sheets can then be packaged in sets, boxed and distributed to the end user through normal commercial channels as would be known. The sheets are then unpackaged and fed by a user through a printer or copier (see FIGS. 4 and 12) for example for a printing operation on the facestock sheet front (and back) side(s) of the printable media and subsequent separation.

Although a single-web process is illustrated in FIG. 38, it is also within the scope of the present invention to use a dual-web process or system. The single-web process uses an eleven inch wide cardstock laminate web 870. In

contrast, a dual-web system, changes the direction of the web through the stations or presses and uses a seventeen-inch wide roll; that is, two side-by-side streams of 8.5 by 8.5 inch web. Some of today's presses allow the wider web width to be processed. An example of the dual-web system is the "Arsoma" press. Unlike the system or process depicted in FIG. 38, a web turning assembly 896 is not provided or needed, because the printing station 884 can print on either the top or bottom of the web 870.

Preferred dimensions and configurations for each of the versions of the business card, greeting card and post card embodiments as depicted in FIGS. 29-36 will now be discussed. Irrespective of which vendor (e.g., Fasson or Moore) is used, the liner sheet 844 and adhesive construction 848 will preferably be the same for each of the embodiments. However, the cardstock 836 would change for the embodiments (as well as for whether the sheet construction is intended for laser or ink jet use). For ink jet use a little bit more ink absorbency is required to allow the dies to penetrate the ink and remain adhered to it. In contrast, for laser printing, a plastic toner is used that is melted on the cardstock 836, so a little bit different surface treatment is needed to obtain good toner anchorage and good heat transfer through the cardstock material to actually bond the plastic to the cardstock.

For the three embodiments, the biggest difference in the cardstock 836 used is the thickness. Business cards are typically thicker and somewhat stiffer than greeting cards and post cards. For example, an average of 8.2-9.0 mils as opposed to an average of 7.4-7.6 mils. The greeting card embodiment would likely have a scored fold line 960 formed at the facestock die cutting station and incorporated in the same die. The post cards are preferably standard four by six inch size; and the additional cut lines 964 at the top and bottom are provide additional flexibility for feeding and passing the sheet construction through the printer or copier. They can also be provided for the greeting cards. Optional short side perforated lines 968 can also be provided to increase flexibility of the sheet construction.

Preferred dimensions in inches (in parentheses) for construction 800, referring to FIGS. 29A and 29B are 970a (7/16), 970b (1/16), 970c (3/8), 970d (3-1/2), 970e (1/2), 970f (1/2), 970g (3/4), 970h (3/4), 970i (2), 970j (1/2), 970k (3/4), 970m (8-1/2), and 970n (1-1/2). For construction 804 in FIGS. 30A and 30B, they are 974a (7/16), 974b (1/16), 974c (3/8), 974d (3-1/2), 974e (2), 974f (1/2), 974g (1/4), 974h (1/2), 974i (1/2), 974j (8-1/2), 974k (1-1/2), 974m (3/4), 974n (11), and 974p (3/4). For construction 808 in FIGS. 31A and 31B, they are 978a (7/16), 978b (4-7/8), 978c (1/8), 978d (6-7/8), 978e (5/8), 978f (1/16), 978g (5/8), 978h (1/4), 978i (5/8), 978j (5/8), 978k (1/4), 978m (8-1/2), 978n (11), and 978p (13/16). For construction 812 in FIGS. 32A and 32B, they are 982a (7/16), 982b (1/8), 982c (13/16), 982d (6-7/8), 982e (4-7/8), 982f (5/8), 982g (5/8), 982h (1/16), 982i (7/8), 982j (7/8), 982k (8-1/2) and 982m (11). For construction 816 in FIGS. 33A and 33B, they are 986a (7/16), 986b (1/8), 986c (13/16), 986d (6-7/8), 986e (4-7/8), 986f (5/8), 986g (1/4), 986h (5/8), 986i (1/16), 986j (5/8), 986m (1/4), 986n (1/4), 986p (11) and 986q (8-1/2). For construction 820 in FIGS. 34A and 34B, they are 990a (7/16), 990b (1/8), 990c (4-7/8), 990d (6-7/8), 990e (13/16), 990f (5/8), 990g (1/16), 990h (7/8), 990i (1/4), 990j (7/8), 990k (8-1/2) and 990m (11). For construction 824 in FIGS. 35A and 35B, they are 994a (7/16), 994b (1/16), 994c (1-1/4), 994d (5/8), 993e (4), 994f (6), 994g (1/2), 994h (2), 994i (5/8), 994j (5/8), 994k (1-1/4), 994m (8-1/2), 994n (1), 994p (1/16), 994q (5/8), 994r (1-1/4), 994s (1/4) and 994t (11). For construction 828 in FIGS. 36A and 36B, they are 998a (7/16), 998b (1/16), 998c (1-1/4), 998d (4), 998e (6), 998f (5/8), 998g (5/8), 998h (1-1/2), 998i (2), 998k (1/2), 998m (1), 998n (5/8), 998p (5/8), 998q (1/16), 998r (1-1/2), 998s (8-1/2) and 998t (11).

Instead of providing the full paper liner laminated to the cardstock, die cutting it and removing the waste strips, an alternative manufacturing method of this invention will now be described. A cardstock web (which does not have a paper liner laminated thereto) is unwound from a roll and indicia printed thereon. Cross-direction lines are die cut therethrough, and then individual paper strips are laminated (with ultraremovable adhesive) to the cardstock web at the desired

locations. The next step is to machine-direction die cut the web. Calendering of the edge of the web can be done right before the printing step or immediately before the machine-direction die cutting step. After the machine-direction die cutting step, the web is sheeted, and the sheets are stacked, packaged, boxed and distributed.

From the foregoing detailed description, it will be evident that there are a number of changes, adaptations and modifications of the present invention which come within the province of those skilled in the art. For example, the printed media instead of being business cards can be post cards, mini-folded cards, tent cards or photo frames. However, it is intended that all such variations not departing from the spirit of the invention be considered as within the scope thereof.

What is Claimed is:

1. A method of forming printable media, comprising:

providing a laminate cardstock including (1) a liner sheet including a paper sheet and ultraremovable adhesive on the sheet, and (2) a cardstock sheet adhered to the ultraremovable adhesive;

cutting through the cardstock sheet to the paper sheet to form cardstock cut lines defining at least in part perimeters of printable media; and

cutting through an outer face of the liner sheet to form liner-sheet cut lines defining a plurality of liner sheet strips on a back side of the laminate cardstock.

2. The method of claim 1 wherein the liner sheet includes an adhesive-receptive coating on the paper sheet, and the ultraremovable adhesive is on the coating.

3. The method of claim 1 wherein some of the liner sheet strips define waste strips, and further comprising removing the waste strips from the cardstock sheet.

4. The method of claim 1 further comprising calendering an infeed end of the laminate cardstock.

5. A method of forming a sheet of printable media, comprising:

(a) providing a roll of a web of laminate sheet construction comprising a liner sheet adhered to a cardstock sheet;

(b) unwinding at least a portion of the web from the roll;

(c) die cutting the cardstock sheet of the unwound web without cutting the liner sheet to form outline perimeters of printable media;

(d) die cutting the liner sheet of the unwound web without cutting the facestock sheet to form liner strips and liner waste strips;

(e) after (d), removing the liner waste strips from the web; and

(f) after (c), (d) and (e), sheeting the web into sheets.

6. The method of claim 5 further comprising after (b), calendering an edge of the unwound web.

7. The method of claim 5 wherein the web is a dual-web, and (f) includes cutting the dual-web into two single lengthwise side-by-side webs.

8. The method of claim 5 further comprising forming a scored fold line in the cardstock sheet.

9. The method of claim 8 wherein the forming is at the same time as the cardstock sheet die cutting.

10. The method of claim 5 further comprising before (c), printing indicia on the cardstock sheet.

11. The method of claim 5 wherein (a) includes providing a roll of the cardstock sheet, unwinding the cardstock sheet roll, laminating the liner sheet to the unwound cardstock sheet to form the web of laminate sheet construction and winding the web to form the web roll.

12. The method of claim 5 wherein the liner sheet includes a paper sheet with ultraremovable adhesive.

13. A method of forming a printable media sheet construction, comprising:

(a) providing a sheet construction including a liner sheet and a facestock sheet;

(b) cutting the facestock sheet without cutting the liner sheet to form printable media;

(c) cutting the liner sheet without cutting the facestock sheet to form a plurality of spaced liner strips on the facestock sheet and liner waste strips between the spaced liner strips; and

(d) after (c), removing the liner waste strips from off of the facestock sheet.

14. The method of claim 13 wherein (a) includes the sheet construction being provided as a web, and further comprising after (d), sheeting the web into sheets.

15. The method of claim 13 wherein the removing includes pulling the liner waste strips on to a rotating cylinder.

16. The method of claim 15 wherein the pulling includes extracting the liner waste strips using a blower system.

17. The method of claim 13 wherein the media are business cards, greeting cards or postcards.

18. The method of claim 13 wherein the liner sheet is a paper liner sheet adhered to the facestock sheet with ultraremovable adhesive.

19. The method of claim 13 further comprising calendering an infeed end of the sheet construction.

20. The method of claim 13 further comprising before (b) and (c), printing indicia on the facestock sheet.

21. A printable card sheet construction, comprising:

a cardstock sheet, the sheet having cut-lines defining a plurality of printable media, the sheet having a front face and an opposite rear face; and

a plurality of liner strips, each of the liner strips including (a) a paper strip, (b) an adhesive-receptive coating on the strip, and (c) ultraremovable adhesive on the coating, each of the paper strips being attached to the rear face of the cardstock sheet with the adhesive and over a separate one of the cut-lines, the liner strips holding the printable media together as a unit for passing through a printer or copier for a printing operation on the cardstock sheet.

22. The construction of claim 21 further comprising an ink jet color-optimized coating on the front face of the cardstock sheet.

23. The construction of claim 21 wherein the cardstock sheet includes a laser color-optimized coating on the front face.

24. The construction of claim 21 wherein the cardstock sheet includes an adhesive receptive coating on the rear face.

25. The construction of claim 21 wherein an infeed end of the cardstock sheet is calendered.

26. The construction of claim 25 wherein the paper strip closest to the infeed end is calendered.

27. The construction of claim 21 wherein the paper strip closest to an infeed end of the cardstock sheet is parallel to and spaced approximately a quarter of an inch inward from an infeed edge of the cardstock sheet at the infeed end.

28. The construction of claim 21 wherein the cardstock sheet includes a cardstock, a printer-receptive coat on a front of the cardstock, and an adhesive-receptive coat on a back of the cardstock.

29. The construction of claim 28 wherein the front coat is approximately 1.0 mil thick, the cardstock is approximately 7.0-9.2 mils thick, the back coat is approximately 0.1 mil thick, the ultraremovable adhesive is approximately .20-.25 mil thick, the adhesive-receptive coat is approximately .1-.5 mil thick, and the paper strip is approximately 2.8-4.0 mils thick.

30. A method of forming printed media, comprising:

(1) providing a printable media sheet construction including (a) a facestock sheet having through-cut lines separating the sheet into a plurality of printable media and (b) a plurality of paper strips attached with ultraremovable adhesive to a back face of the facestock sheet and over at least some of the through-cut lines and thereby holding the printable media together;

(2) separately feeding the printable media sheet construction off a stack of same via an automatic feed tray into a printer or copier and thereby conducting a printing operation on the printable media; and

(3) after the printing operation, separating the printed printable media from the paper strips off of the ultraremovable adhesive.

31. The method of claim 30 wherein the sheet construction includes a calendered edge, and the feeding is conducted calendered edge first.

32. The method of claim 30 wherein the printable media sheet construction includes the printable media including at least one scored fold line, and after the printing operating folding the printed media on the fold line.

33. The method of claim 30 wherein the facestock sheet includes an infeed edge, the paper strip closest to the infeed edge is generally parallel to the infeed edge and is spaced approximately one-quarter inch from the infeed edge, and the feeding step includes feeding the printable media sheet construction infeed edge first into the printer or copier.

34. The method of claim 30 wherein the printing operation defines a first printing operation on a first side of the printable media, and further comprising a second printing operation, before the separating, in the printer or copier on an opposite second side of the printable media.

35. A method of forming a printable media sheet construction, comprising:

(a) providing a cardstock web;

(b) cutting cross-direction lines through the web;

(c) after (b), laminating a plurality of paper strips to the web; and

(d) after (c), cutting machine-direction lines through the web.

36. The method of claim 35 further comprising before (b), printing indicia on the web.

37. The method of claim 35 further comprising calendering an edge of the web.

38. The method of claim 37 wherein the calendering is before (b)

39. The method of claim 37 wherein the calendering is after (c) and before (d).

40. The method of claim 35 wherein the laminating uses ultraremovable adhesive.

41. The method of claim 35 further comprising after (d), sheeting the web into sheets.

42. The method of claim 35 wherein the cross-direction lines and the machine-direction lines divide the cardstock into individual printable cards.

43. A sheet of printable media, comprising:

a facestock sheet having first and second sides;

an adhesive layer on said second side;

a film secured on said adhesive layer;

said facestock sheet, said adhesive layer and said film forming a laminate facestock;

a liner sheet having one face and an opposite outer face, said one face being secured on said film;

facestock cut lines on said first side and extending through said laminate facestock and to said liner sheet, and defining at least in part edges of printable media; and

liner-sheet cut lines on said outer face, extending through said liner sheet and to said laminate facestock, and defining liner sheet strips on said laminate facestock.

44. The sheet of claim 43 wherein a strip of said laminate facestock at an edge of said laminate facestock is removed to expose a strip of said liner sheet.

45. The sheet of claim 44 wherein said strip of said liner sheet defines an infeed edge for feeding the sheet of printable media into a vertical feed ink jet printer.

46. The sheet of claim 44 wherein said strip of said liner sheet is approximately 1/2 inch wide.

47. The sheet of claim 44 wherein one of said facestock cut lines defines an edge of said strip of said liner sheet.

48. The sheet of claim 44 wherein said strip of said liner sheet covers at least one of said facestock cut lines.

49. The sheet of claim 43 wherein said facestock sheet is a glossy cardstock.

50. The sheet of claim 43 wherein at least some of said liner sheet strips are on and cover at least some of said facestock cut lines to hold at least in part said laminate facestock together during a printing operation on said first side by a printer or copier.

51. The sheet of claim 50 wherein alternating ones of said liner sheet strips are removed from said laminate facestock before the printing operation.

52. The sheet of claim 50 wherein the printable media comprise business cards.

53. The sheet of claim 43 wherein said liner sheet strips extend across the width of said laminate facestock, parallel to one another.

54. The sheet of claim 43 wherein at least some of said strips are along and over at least some of said facestock cut lines

55. The sheet of claim 43 wherein said liner-sheet cut lines extend at an angle on said laminate facestock.

56. The sheet of claim 43 wherein said facestock cut lines define a waste border portion of said laminate facestock surrounding said printable media.

57. The sheet of claim 43 wherein a lead-in edge of the sheet is calendered to improve feed of the sheet into the printer or copier.

58. The sheet of claim 43 wherein none of said strips of said liner sheet is removed from said laminate facestock before the sheet is fed into a printer or copier for a printing operation on said first side.

59. The sheet of claim 43 wherein an infeed edge of the sheet is thinner than the body of the sheet.

60. The sheet of claim 43 wherein said adhesive layer comprises a hot melt adhesive, said film is a low density polyethylene film, said liner sheet is a densified kraft liner sheet, and said facestock sheet is an uncoated dry tag sheet.

61. The sheet of claim 60 wherein said hot melt adhesive layer is approximately .6 mil thick, said low density polyethylene film is approximately .8 mil thick, said densified kraft liner sheet is approximately 3.0 mil thick and said uncoated dry tag sheet is approximately 9.0 mil thick.

62. The sheet of claim 43 wherein said strips include strips of a first width and strips of a second width which is different than the first width.

63. The sheet of claim 43 further comprising a leading-edge cut line on said outer face, through said liner sheet and to said laminate facestock, said

leading-edge cut line being disposed about 1/8 to 3/8 inch away from a lead edge of the sheet and extending parallel to the lead edge from one side edge of the sheet to the other, said leading-edge cut line providing flexibility to a lead end of the sheet for feeding the sheet into a printer or copier or transport therethrough.

64. The sheet of claim 63 wherein said laminate facestock at a lead end of the sheet is calendered.

65. The sheet of claim 63 wherein said leading-edge cut line is parallel to said liner-sheet cut lines.

66. The sheet of claim 43 wherein each of said liner sheet strips extends the full width of said laminate facestock.

67. The sheet of claim 43 wherein at least some but not all of said strips are removed from said laminate facestock before said laminate facestock is fed into a printer for a printing operation on said printable media.

68. The sheet of claim 67 wherein said removed strips comprise alternate ones of said strips.

69. The sheet of claim 43 wherein at least some of said liner sheet strips extend only part way across said laminate facestock and are removed from said laminate facestock before the sheet is fed into a printer or copier for a printing operation on said first side.

70. The sheet of claim 69 wherein said at least some of said liner sheet strips include a plurality of pairs of said strips, each pair including a first said strip on a left side of said laminate facestock and a second said strip directly

opposite on a right side of said laminate facestock with a central liner strip therebetween.

71. A sheet of printable media, comprising:

a facestock sheet having a front side, a back side, a pair of side edges and first and second end edges;

cut lines through said facestock sheet and defining printable media, said cut lines including a first end cut line proximate to and parallel to said first edge, a second end cut line proximate to and parallel to said second edge, and central cut lines disposed between and parallel to said first and second end cut lines; and

a plurality of liner strips releasably attached to said back side, said liner strips including a first end liner strip;

said first end liner strip covering said first end cut line, extending to both of said first and second side edges and extending to and along said first edge;

said first end liner strip including a first flexibility cut line extending a full length of said first end liner strip; and

said first flexibility cut line being disposed between said first edge and said first cut line and dividing said first end liner strip into two parts.

72. The sheet of claim 71 wherein said facestock sheet is a glossy cardstock.

73. The sheet of claim 71 wherein said liner strips include a second end liner strip, said second end liner strip covering said second end cut line, extending to both of said first and second side edges and extending to and along said second edge, said second end line strip including a second flexibility cut line extending a full length of said second end liner strip, and said second flexibility cut line being disposed between said second edge and said second cut line and dividing said second end liner strip into two parts.

74. The sheet of claim 71 wherein said liner strips are bonded to said back side without adhesive.

75. A sheet of printable media, comprising:

a facestock sheet having a front side, a back side, a pair of side edges, and a pair of end edges;

cut lines through said facestock sheet;

said cut lines including frame cut lines and grid cut lines;

said frame cut lines including a pair of side cut lines spaced in from respective said side edges and parallel thereto and a pair of end cut lines spaced in from respective said end edges, both of said end cut lines engaging both of said side cut lines, and none of said side and end cut lines engaging any of said sheet edges;

said frame cut lines separating said facesheet stock into a central area and a frame encircling said central area;

said grid cut lines defining a grid disposed in said central area;

said grid cut lines and said frame cut lines separating said central area into a plurality of rectangular printable cards; and

a plurality of liner strips releasably secured to said back side parallel to one another;

said liner strips including first strips and second strips;

said first strips including end first strips and central first strips;

said end first strips covering both of said end cut lines;

said central first strips covering all of respective said cut lines of said grid cut lines parallel to said end cut lines;

said second strips being positioned between and parallel to said first strips; and

each of said second strips at both ends thereof extending beyond said side cut lines.

76. The sheet of claim 75 wherein said first strips define wide strips and said second strips define thin strips having thinner widths than said wide strips.

77. The sheet of claim 76 wherein one of said end wide strips extends out beyond an edge of said facestock sheet and along said edge to define a printer infeed end of the sheet.

78. The sheet of claim 77 wherein the sheet includes an opposite end opposite to said printer infeed end, and said facestock sheet is calendered along said opposite end.

79. The sheet of claim 78 wherein said printer infeed end defines a printer infeed end for feeding the sheet into a vertical feed printer and said opposite end defines a printer infeed end for feeding the sheet into a horizontal feed printer.

80. The sheet of claim 77 wherein said one of said end wide strips extends out about 1/2 inch along said edge.

81. The sheet of claim 77 wherein said one of said end wide strips covers one of said frame cut lines on a back side of said facestock sheet.

82. The sheet of claim 76 wherein said facestock sheet has on said front side a first calendered end between one said edge and said end cut line closest thereto and a second calendered end between the other said edge and the other said end cut line.

83. The sheet of claim 76 wherein said facestock sheet is a glossy cardstock.

84. The sheet of claim 76 wherein both ends of said thin strips and of said central wide strips are spaced a distance inwardly from adjacent said side edges.

85. The sheet of claim 84 wherein both ends of both of said end wide strips engage respective said side edges.

86. The sheet of claim 76 wherein said thin strips are each approximately 1/4 inch wide and said wide strips are each approximately 3/4 inch wide.

87. The sheet of claim 76 wherein said facestock sheet comprises a dry tag sheet.

88. The sheet of claim 76 wherein said liner strips comprise densified bleached kraft liner strips.

89. The sheet of claim 76 wherein both of said end wide strips include flexibility cut lines extending therethrough and to but not into said back side, each of said flexibility cut lines being positioned between an adjacent said end edge and an adjacent said end cut line and dividing its said end wide strip into two adjacent parallel strips.

90. The sheet of claim 76 wherein each said liner strip is spaced a distance from adjacent said liner strips, two of said thin strips are positioned between each pair of said wide strips, and each of said thin wide strips and said central wide strips has rounded corners.

91. A sheet of printable media, comprising:

a dry laminate facestock including (1) a facestock sheet having first and second sides, (2) an adhesive layer on said second side, and (3) a film layer on said adhesive layer;

facestock cut lines on said first side, through said laminate facestock and defining at least in part perimeter edges of printable media; and

liner strips adhered to a back side of said film layer, and engaging at least in part said facestock cut lines to thereby hold the printable media together as said laminate facestock is fed into and passed through a printer or copier and a printing operation is performed on the printable media to form printed media.

92. The sheet of claim 91 wherein one of said liner strips is positioned along an edge of said laminate facestock and extends out therefrom and therealong.

93. The sheet of claim 92 wherein said one of said liner strips defines a thin infeed edge of the sheet of printable media for feeding the sheet into a vertical feed printer.

94. The sheet of claim 93 wherein an edge of said laminate facestock opposite to said infeed edge is calendered to define an infeed edge of the sheet of printable media for feeding the sheet into a horizontal feed printer.

95. The sheet of claim 92 wherein said one of said liner strips extends out from said edge approximately 1/2 inch.

96. The sheet of claim 91 wherein said facestock sheet is a glossy cardstock.

97. The sheet of claim 91 wherein the printed media are cleanly separable from said liner strips and from each other to define a plurality of

individual printed media, each of the individual printed media is a printed business card, and said facestock cut lines define a waste border portion of said laminate facestock which encircles said printable media.

98. The sheet of claim 91 wherein said liner strips are generally parallel to each other and spaced a distance apart from neighboring said liner strips.

99. The sheet of claim 91 wherein said liner strips are positioned at an angle on the back side of said laminate facestock.

100. The sheet of claim 91 wherein each of said liner strips has wavy curving side edges.

101. The sheet of claim 91 wherein said liner strips are immediately adjacent one another along their side edges and together cover the entirety of said back side of said laminate facestock.

102. The sheet of claim 91 wherein said laminate facestock is calendered along a leading edge thereof.

103. The sheet of claim 91 wherein said facestock cut lines define a grid of lines including parallel first cut lines and parallel second cut lines perpendicular to said first cut lines, some of said liner strips cover said second cut lines and other of said liner strips are disposed between adjacent ones of said second cut lines and cross over said first cut lines.

104. A multi-layer sheet construction, comprising:

a face sheet; and

a backing sheet adhered to said face sheet to form a multi-layer sheet having a first edge and an opposite second edge;

said backing sheet extending out a distance past said face sheet along said first edge whereby said first edge defines an infeed edge for feeding said multi-layer sheet construction into a horizontal feed printer; and

said multi-layer sheet is calendered along said second edge whereby said second edge defines an infeed edge for feeding said multi-layer sheet construction into a vertical feed printer.

105. The construction of claim 104 further comprising face-sheet cut lines on a front side of said face sheet, extending therethrough to said backing sheet, and defining at least in part edges of printable media adapted to be printed on by the horizontal feed printer or the vertical feed printer, and wherein said backing sheet along said first edge covers at least one of said face-sheet cut lines.

106. The construction of claim 105 further comprising a layer of adhesive positioned between said face sheet and said backing sheet.

107. The construction of claim 105 wherein said face sheet includes on a back surface thereof a layer of adhesive and a film layer on said layer of adhesive.

108. The construction of claim 105 further comprising an adhesive layer on a back side of said face sheet and a film layer on said adhesive layer, wherein said face sheet is a facestock sheet, wherein said facestock sheet, said adhesive layer and said film layer define a dry laminate facestock, and wherein said backing sheet is a liner sheet.

109. The construction of claim 108 further comprising facestock cut lines on a front side of said laminate facestock and extending through said

laminate facestock and to said liner sheet, and defining at least in part edges of printable media adapted to be printed on by the horizontal feed printer or the vertical feed printer.

110. The construction of claim 109 further comprising liner-sheet cut lines on an outer face of said liner sheet, extending through said liner sheet and to said laminate facestock, and defining liner sheet strips on said laminate facestock.

111. The construction of claim 110 wherein at least a substantial number of alternating ones of said strips are removed from said laminate facestock before the multi-layer sheet construction is fed into the horizontal feed printer or the vertical feed printer.

112. The construction of claim 109 wherein said printable media after a printing operation thereon in the horizontal feed printer or the vertical feed printer and the separation from the rest of the multi-layer sheet construction define printed business cards.

113. The construction of claim 109 wherein said adhesive layer is a hot melt adhesive layer, said film is a low density polyethylene film, said liner sheet is a densified bleached kraft liner sheet, and said facestock sheet is an uncoated dry tag sheet.

114. The construction of claim 109 wherein said facestock sheet comprises a glossy cardstock.

115. A method of forming printable media, comprising the steps of:

providing a laminate sheet construction comprising (1) a film-coated liner sheet having a film layer on a liner sheet and (2) a facestock sheet adhered with

an adhesive layer to the film layer of the film-coated liner sheet; the facestock sheet, the film layer and the adhesive layer together forming a laminate facestock;

cutting through the laminate facestock to the liner sheet to form facestock cut lines defining at least in part perimeters of printable media; and

cutting through an outer face of the liner sheet to form liner-sheet cut lines defining a plurality of liner sheet strips on a back side of the laminate facestock.

116. The method of claim 115 further comprising removing an end strip of the laminate facestock to expose a top surface of a strip of an end one of the liner sheet strips, the exposed strip defining a printer infeed end of the laminate sheet construction.

117. The method of claim 116 wherein the printer infeed end defines a first printer infeed end, and further comprising calendering an end of the laminate sheet construction opposite to the exposed strip to define a second printer infeed end of the laminate sheet construction.

118. The method of claim 117 further comprising feeding the laminate sheet construction via the first printer infeed end into a vertical feed ink jet printer.

119. The method of claim 117 further comprising feeding the laminate sheet construction via the second printer infeed end into a horizontal feed ink jet printer.

120. The method of claim 116 wherein said removing step is before said liner sheet cutting step.

121. The method of claim 116 wherein said removing step is after said liner sheet cutting step.

122. The method of claim 115 further comprising removing some of the strips from the laminate facestock before feeding the laminate facestock into a printer or copier for a printing operation thereon.

123. The method of claim 122 wherein said removing includes peeling said some of the strips off of the film layer.

124. The method of claim 122 wherein the strips remaining on the laminate facestock after said removing step cover at least a substantial proportion of the facestock cut lines.

125. The method of claim 122 wherein said removing includes removing alternate ones of the strips.

126. The method of claim 115 further comprising feeding the laminate facestock through a printer or copier for a printing operation on the facestock sheet to print on the printable media and thereby form printed media.

127. The method of claim 126 further comprising after the printing operation, removing the printed media from the strips.

128. The method of claim 127 wherein said removing step includes peeling the printed media off of the strips.

129. The method of claim 128 wherein the removed printed media comprise individual, printed clean edge business cards.

130. The method of claim 126 wherein said feeding step includes automatically individually feeding the laminate facestock in a stack of same from an automatic feed tray of the printer and into the printer.

131. The method of claim 115 wherein the liner-sheet strips extend diagonally on the back of the laminate facestock.

132. The method of claim 115 wherein the liner-sheet cut lines have a wavy curved shape across the back of the laminate facestock.

133. The method of claim 115 wherein said liner-sheet cut lines cutting step is after said facestock cut lines cutting step.

134. The method of claim 133 wherein said laminate sheet construction providing step includes cutting the laminate sheet construction off of a web of laminate sheet construction material.

135. The method of claim 115 wherein said facestock cut lines define the entire perimeters of all of the printable media.

136. The method of claim 115 wherein said cutting steps both comprise die cutting.

137. The method of claim 115 wherein said cutting steps both comprise laser cutting.

138. The method of claim 115 wherein the liner sheet comprises a densified bleached kraft paper liner sheet, and the film layer comprises a low density polyethylene layer which is extrusion coated on the densified bleached kraft paper liner sheet.

139. The method of claim 115 wherein the adhesive layer comprises hot melt pressure sensitive adhesive, and the facestock sheet is laminated with the adhesive layer to the film layer of the film-coated liner sheet.

140. The method of claim 115 wherein the laminate sheet construction is provided in a roll, and further comprising before said cutting steps, loading the roll onto a press with the liner sheet side up.

141. The method of claim 140 wherein said facestock cut lines cutting step comprises after said loading step, die cutting the laminate sheet construction from the bottom up, and wherein said liner-sheet cut lines cutting step comprises die cutting the laminate sheet construction from the top down.

142. The method of claim 115 further comprising calendering a lead-in edge of the laminate sheet construction.

143. The method of claim 142 wherein said calendering step is before both of said cutting steps.

144. The method of claim 142 wherein said calendering stop includes calendering both a lead-in edge of the liner sheet and of the facestock sheet.

145. The method of claim 115 further comprising after both of said cutting steps, feeding the laminate facestock into an ink jet printer for a printing operation on the facestock sheet and thereby forming a sheet of printed media.

146. The method of claim 115 wherein at least one of said cutting steps includes laser cutting.

147. A method of forming sheets of printable media, comprising the steps of:

(a) providing a roll of a web of dry laminate sheet construction comprising a liner sheet on a facestock sheet;

(b) unwinding the web from the roll;

(c) calendering an edge of the unwound web;

(d) die cutting the facestock sheet of the unwound web without cutting the liner sheet to form outline perimeters of printable media;

(e) die cutting the liner sheet of the unwound web without cutting the facestock sheet to form liner strips;

(f) after step (e), removing at least some but not all of the liner strips from the web; and

(g) after steps (c), (d), (e) and (f), sheeting the web into sheets.

148. The method of claim 147 further comprising removing an end strip of the facestock sheet to expose a top surface of a strip of the liner sheet.

149. The method of claim 148 wherein the exposed liner sheet strip is opposite to the calendered edge.

150. The method of claim 149 further comprising feeding the sheet with the exposed liner sheet strip first into a vertical feed printer.

151. The method of claim 149 further comprising feeding the sheet with the calendered edge first into a horizontal feed printer.

152. The method of claim 147 wherein step (c) is before steps (d) and (e).

153. The method of claim 152 wherein step (d) is before step (e).

154. The method of claim 147 wherein step (c) is after steps (d) and (e).

155. The method of claim 147 wherein the removed liner strips of step (f) form a waste liner matrix from the web, and step (f) includes winding the waste liner matrix on a roll.

156. The method of claim 147 further comprising after step (g), stacking the sheets in a stack and packaging the stack in a package.

157. The method of claim 147 further comprising after step (b) and before step (g), printing indicia on the facestock sheet.

158. The method of claim 157 wherein the indicia includes product code indicia and manufacturer indicia.

159. The method of claim 157 wherein said printing step is before steps (c), (d) and (e).

160. The method of claim 157 wherein said printing step is with the facestock sheet facing up and the liner sheet facing down, and after said printing step, turning the web so that the liner sheet is facing up.

161. The method of claim 147 wherein steps (c), (d), (e) and (f) are with the web disposed with the liner sheet facing up and the facestock sheet facing down.

162. A method of forming a printable media sheet construction, comprising the steps of:

(a) providing a sheet construction including a liner sheet and a facestock sheet;

(b) cutting the facestock sheet without cutting the liner sheet to form printable media;

(c) cutting the liner sheet without cutting the facestock sheet to form a plurality of spaced liner strips on the facestock sheet and a web of interconnected liner waste strips between the spaced liner strips; and

(d) after step (c), removing the web as a single unit from off of the facestock sheet.

163. The method of claim 162 further comprising (e) removing an end strip of the facestock sheet to expose a printer infeed end strip of the liner sheet.

164. The method of claim 163 wherein step (e) is after steps (b) and (c).

165. The method of claim 163 wherein step (e) is before steps (b) and (c).

166. The method of claim 163 further comprising (f) calendering an edge of the facestock sheet opposite to the end strip of the liner sheet.

167. The method of claim 162 wherein step (d) includes winding the web on a roll.

168. The method of claim 162 wherein step (c) is after step (b).

169. The method of claim 162 further comprising (e) calendering opposite ends of the sheet construction.

170. A method of forming a printable media sheet construction, comprising the steps of:

(a) providing a multi-layer sheet including a face sheet and a backing sheet adhered to the face sheet, the multi-layer sheet having a first edge and an opposite second edge;

(b) removing an end strip of the face sheet to expose an end strip of the backing sheet along the first edge, the exposed end strip defining a first infeed end of the multi-layer sheet for feeding the multi-layer sheet into a vertical feed printer; and

(c) calendering the opposite second edge to define a second infeed end of the multi-layer sheet for feeding the multi-layer sheet into a horizontal feed printer.

171. The method of claim 170 wherein the multi-layer sheet comprises a vinyl cast on casting sheet.

172. The method of claim 170 wherein the multi-layer sheet comprises a coextrusion of polymers.

173. The method of claim 170 further comprising step (d) feeding the multi-layer sheet into a printer and conducting a printing operation on the face sheet.

174. The method of claim 173 wherein step (d) includes the printer being the vertical feed printer and feeding the multi-layer sheet via the first infeed end into vertical feed printer.

175. The method of claim 174 wherein said feeding comprises automatic stack feeding of the multi-layer sheets.

176. The method of claim 173 wherein step (d) includes the printer being the horizontal feed printer and feeding the multi-layer sheet via the second infeed end into the horizontal feed printer.

177. The method of claim 176 wherein said feeding comprises automatic stack feeding of multi-layer sheets.

178. The method of claim 170 further comprising step (d) forming face-sheet cut lines in the face sheet and to but not into the backing sheet to define printable media.

179. The method of claim 178 wherein step (b) includes removing the strip along one of the face-sheet cut lines.

180. The method of claim 170 wherein the face sheet includes a facestock sheet, an adhesive layer on a back side of the facestock sheet and a film layer on the adhesive layer, and the face sheet, the adhesive layer and the film layer thereby defining a dry laminate facestock.

181. The method of claim 170 wherein step (b) is before step (c).

182. The method of claim 170 wherein step (c) is before step (b).

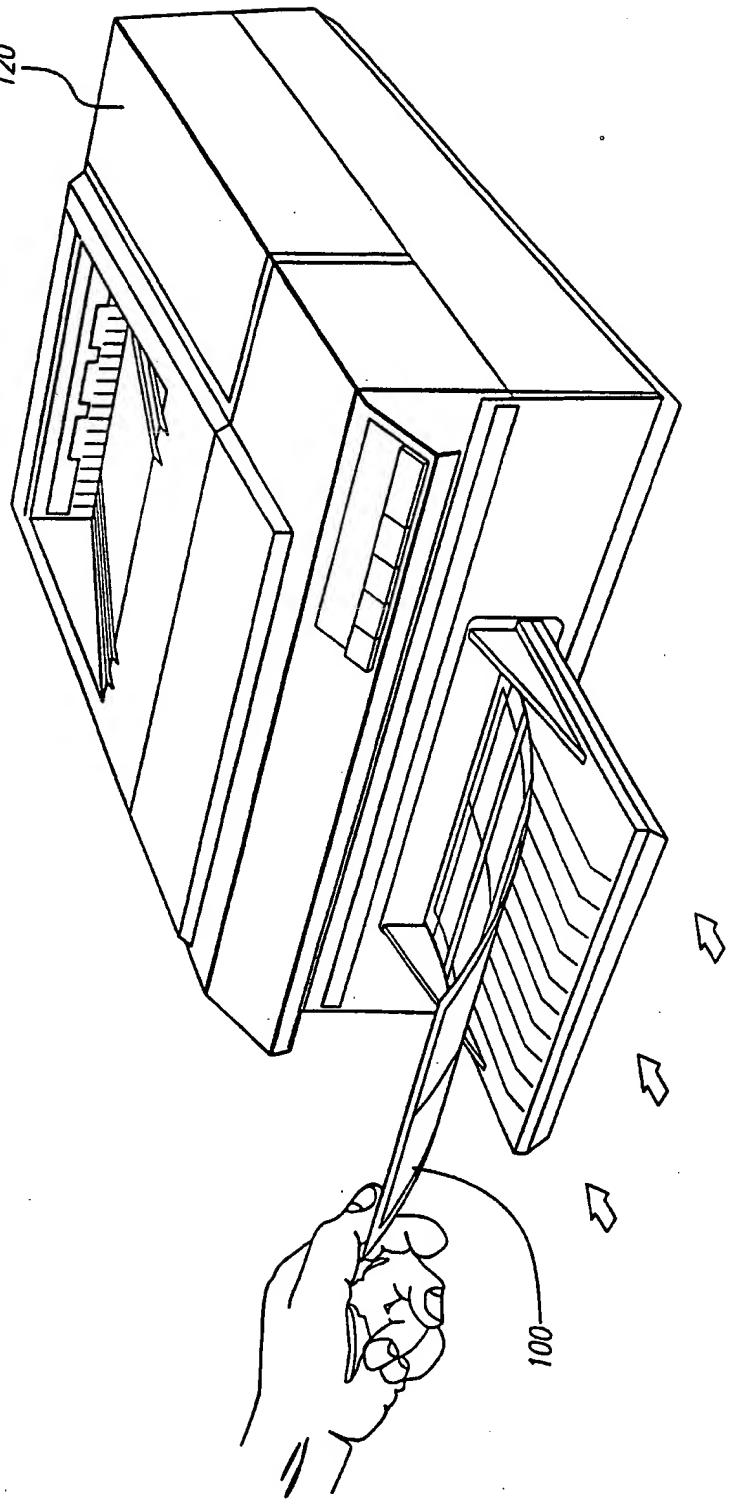


FIG. 1 PRIOR ART

FIG. 2 PRIOR ART

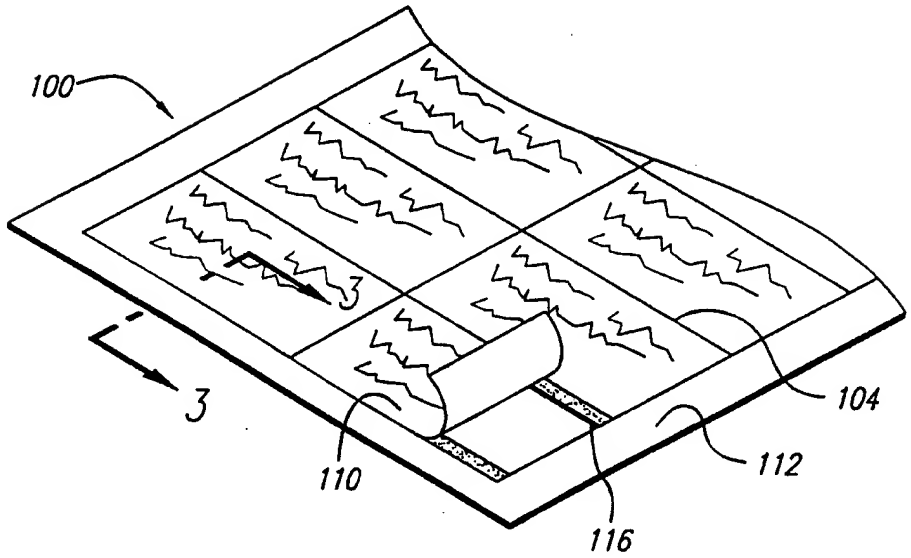
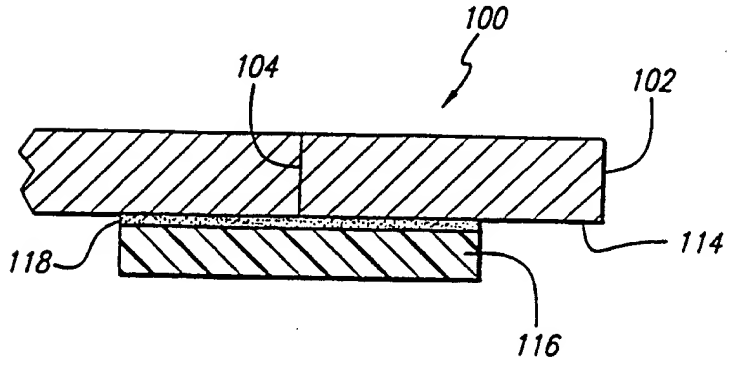


FIG. 3 PRIOR ART



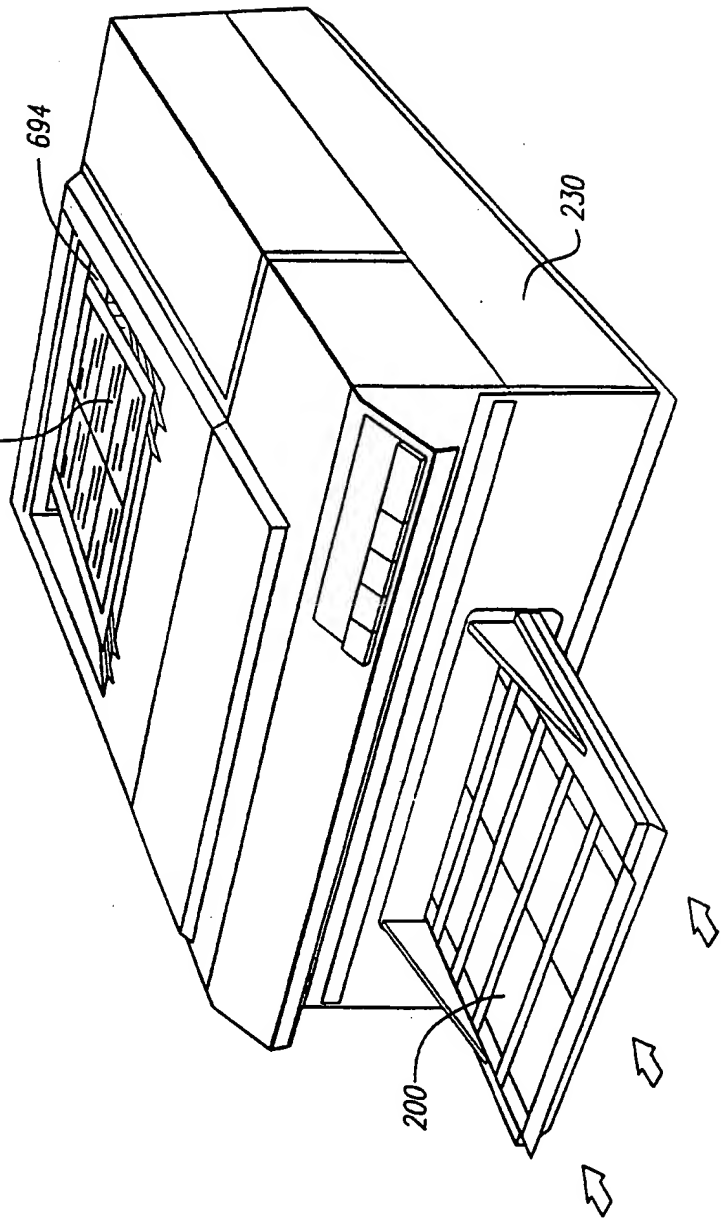


FIG. 4

FIG. 5

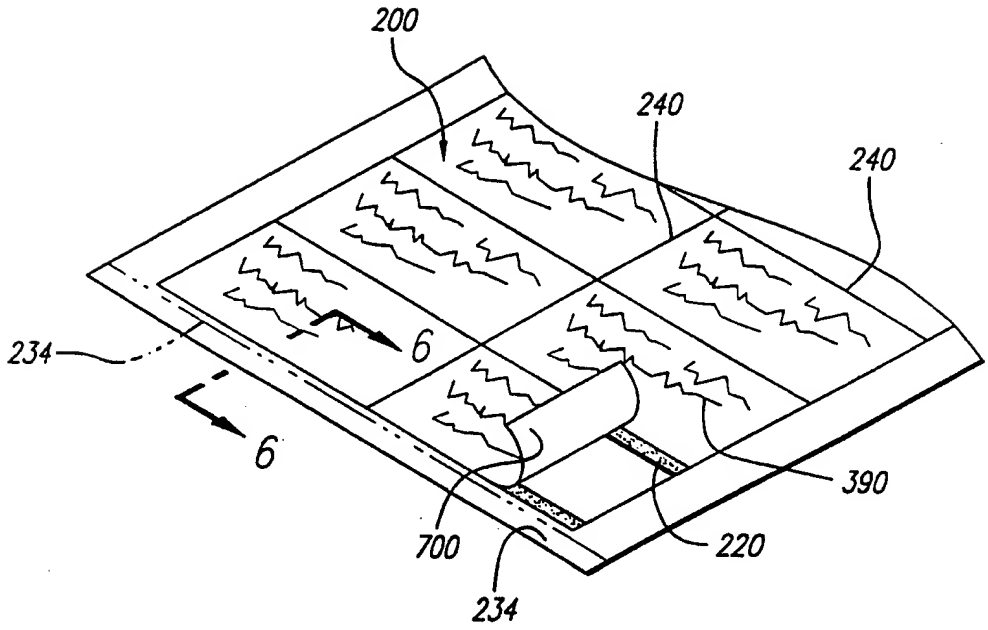

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FIG. 6

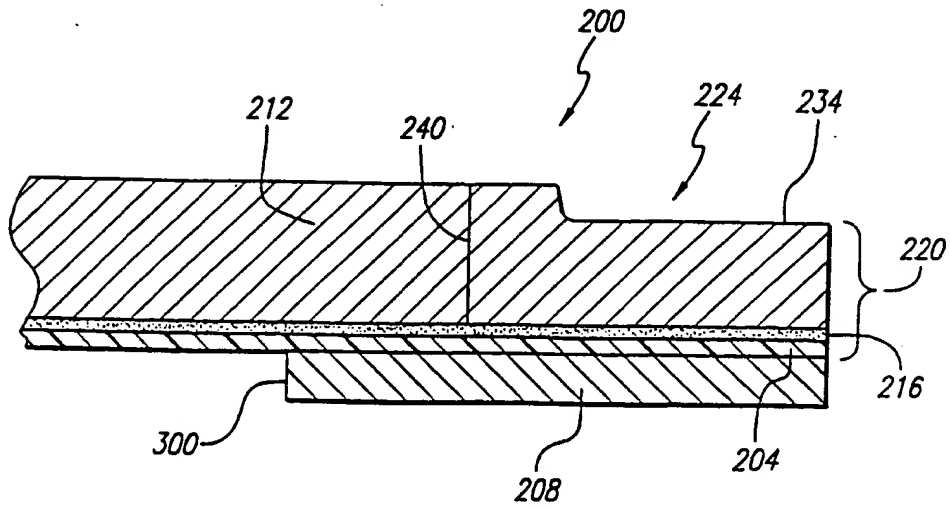
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FIG. 13

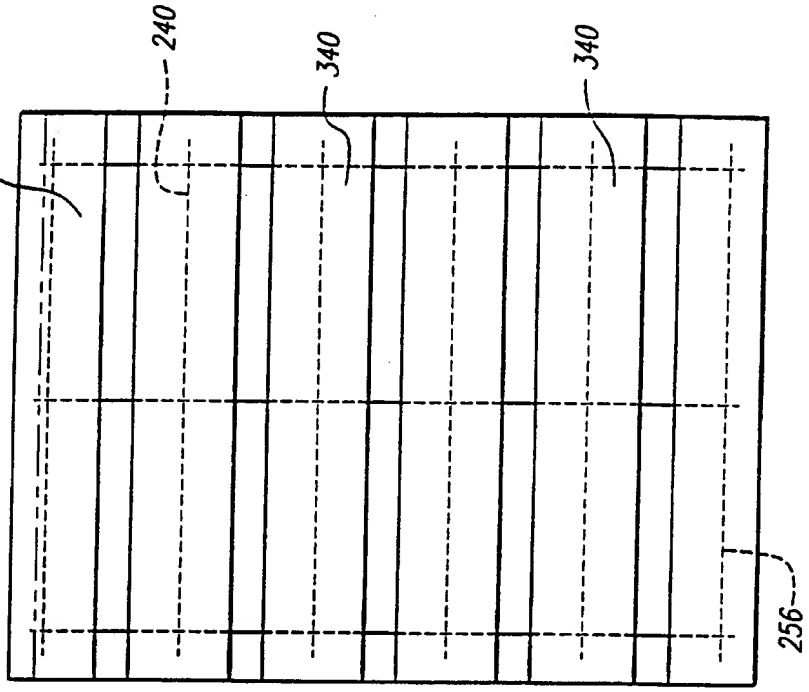


FIG. 7

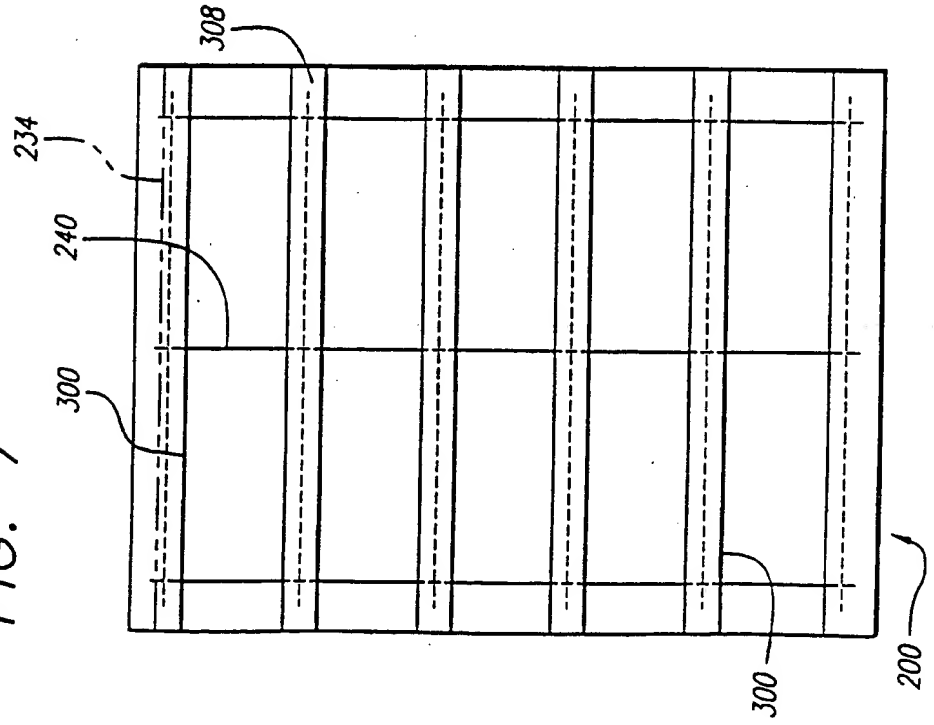
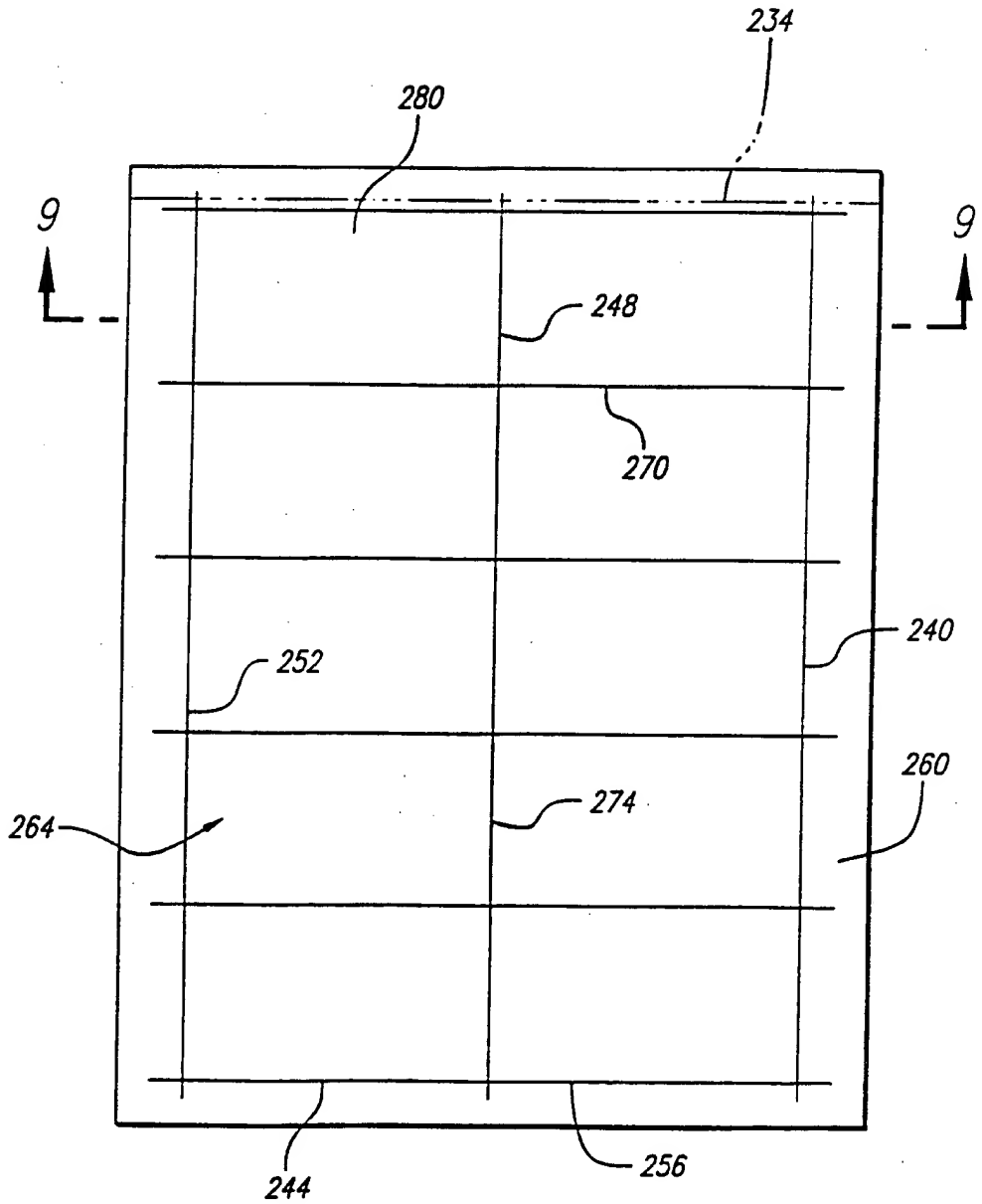


FIG. 8



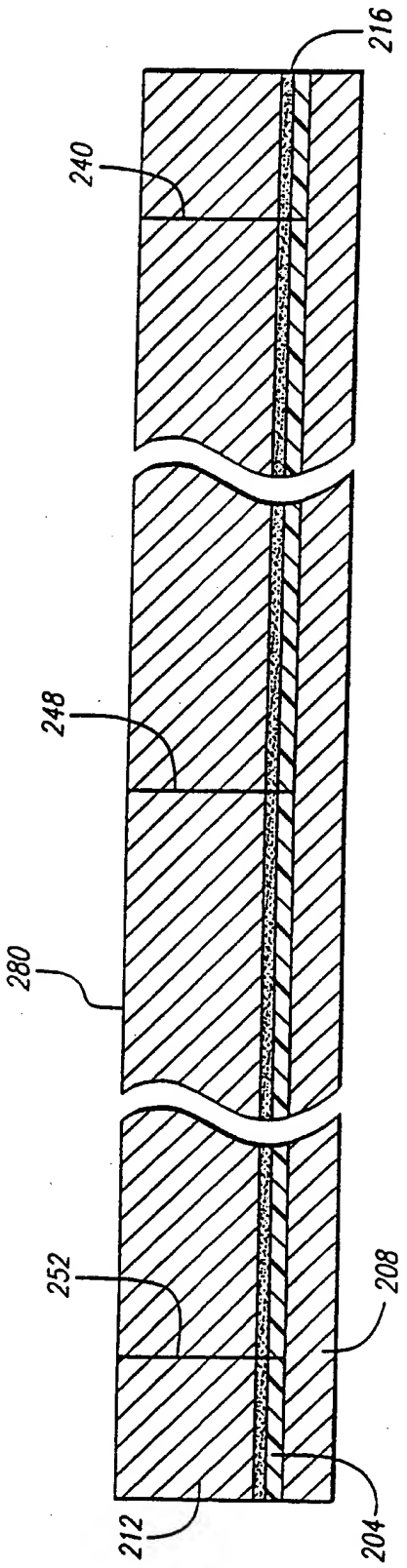


FIG. 9

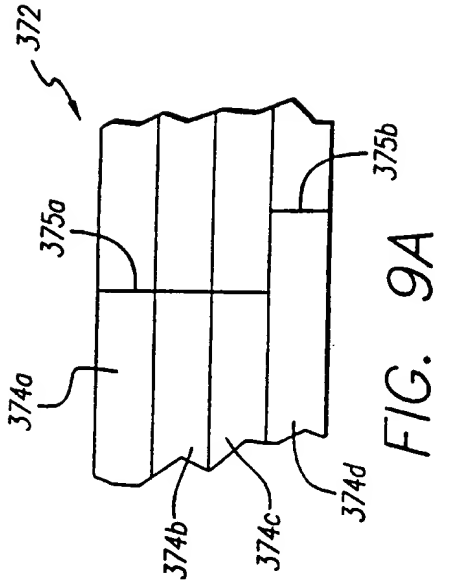


FIG. 9A

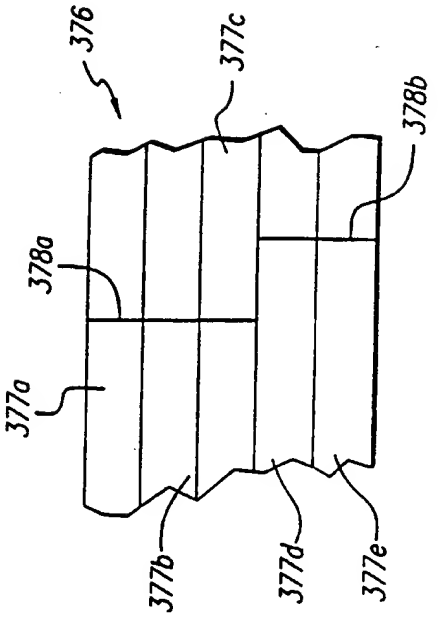


FIG. 9B

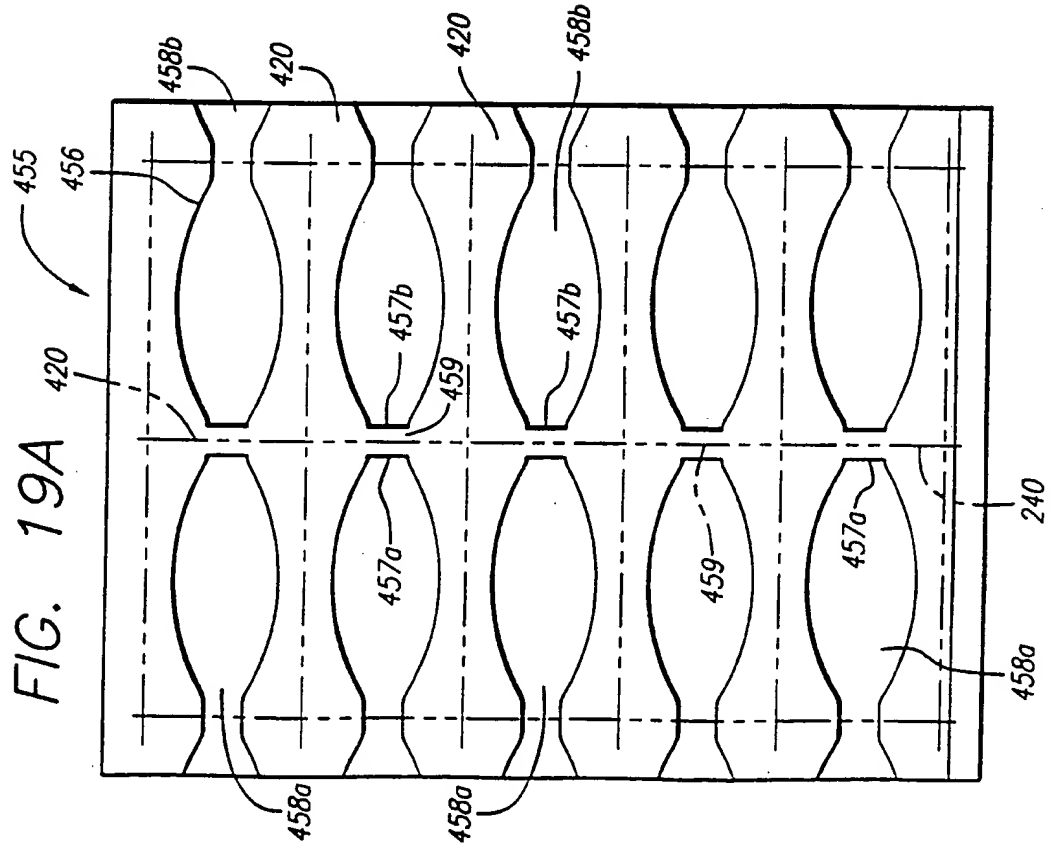
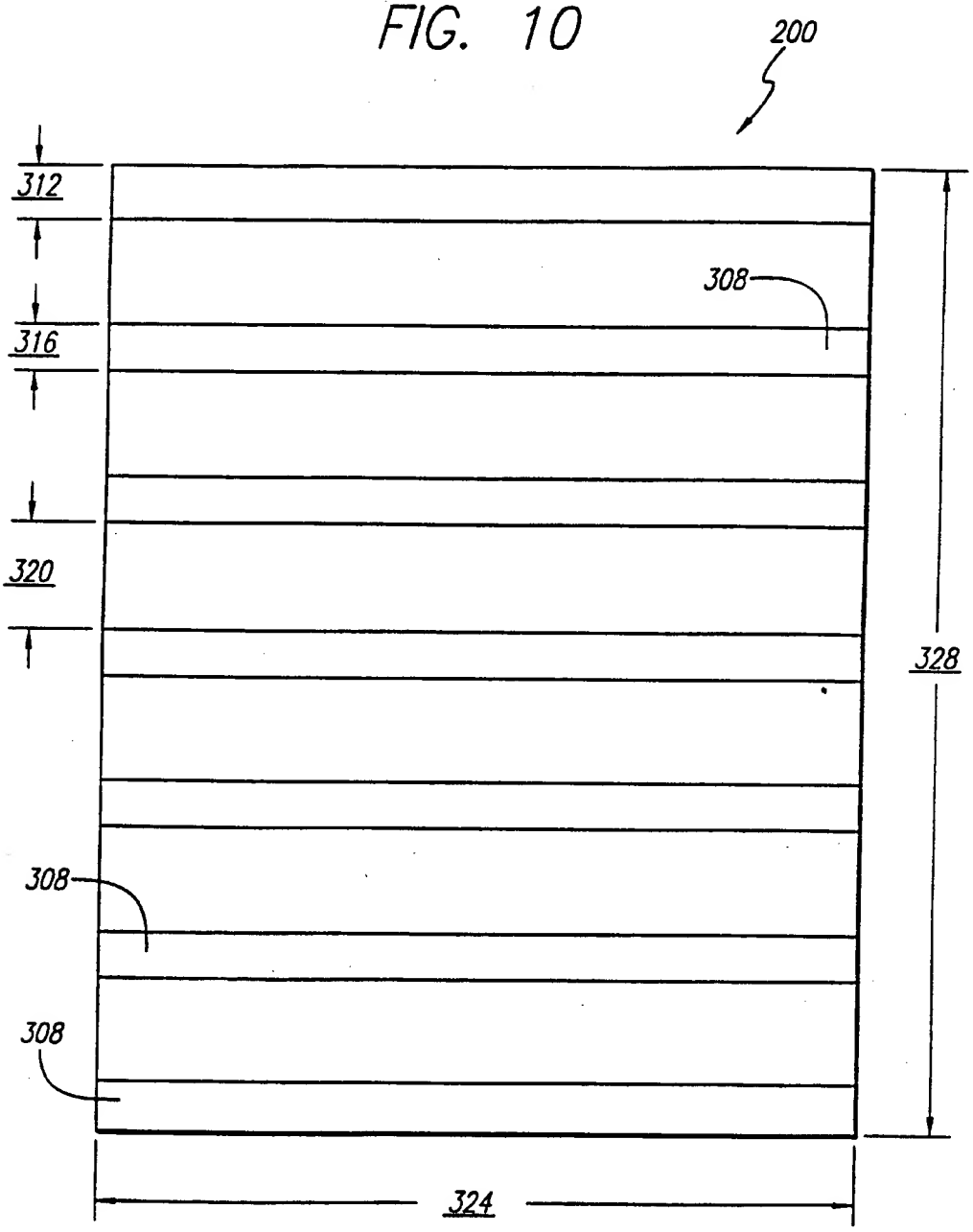


FIG. 19A

FIG. 10



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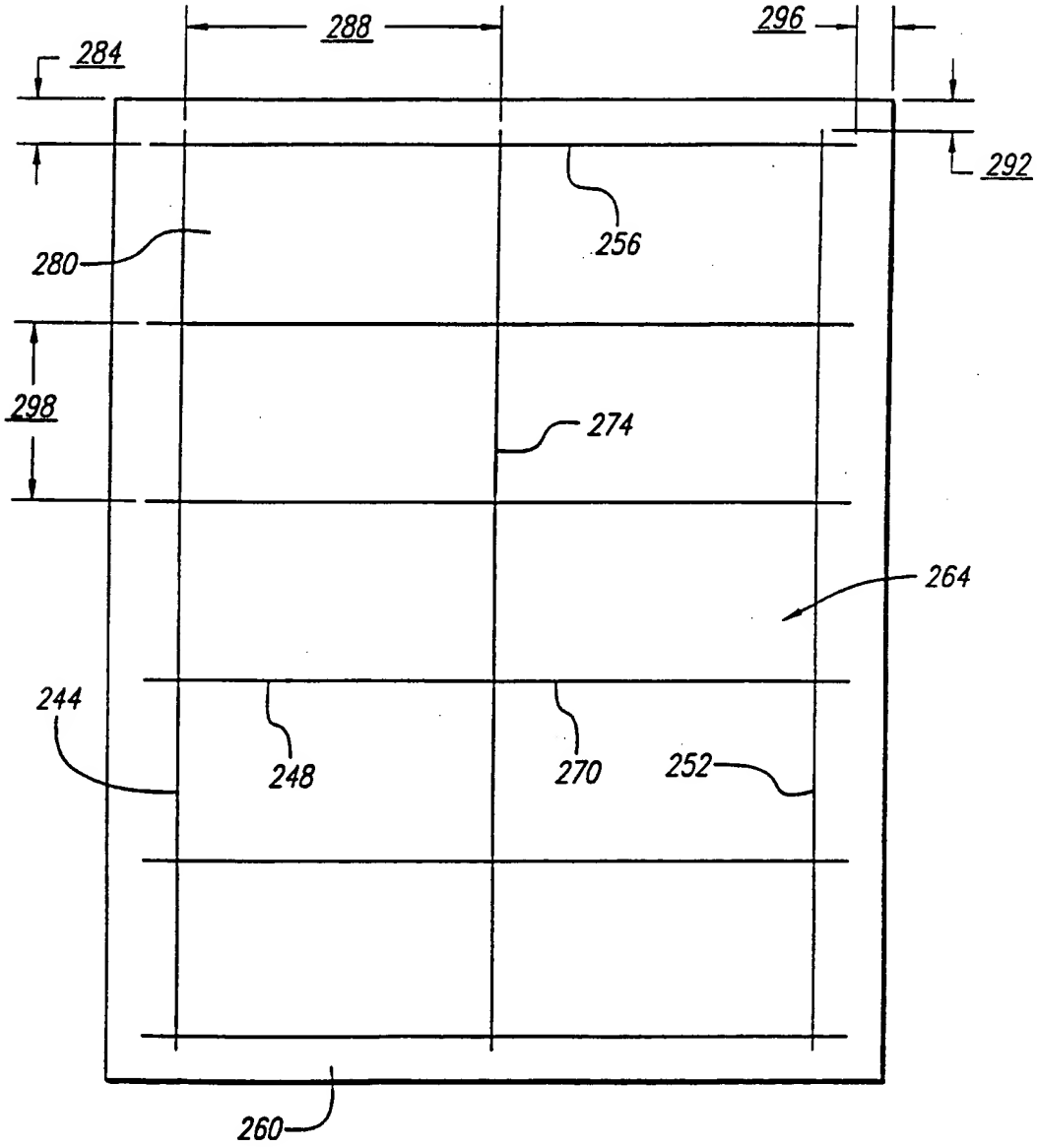


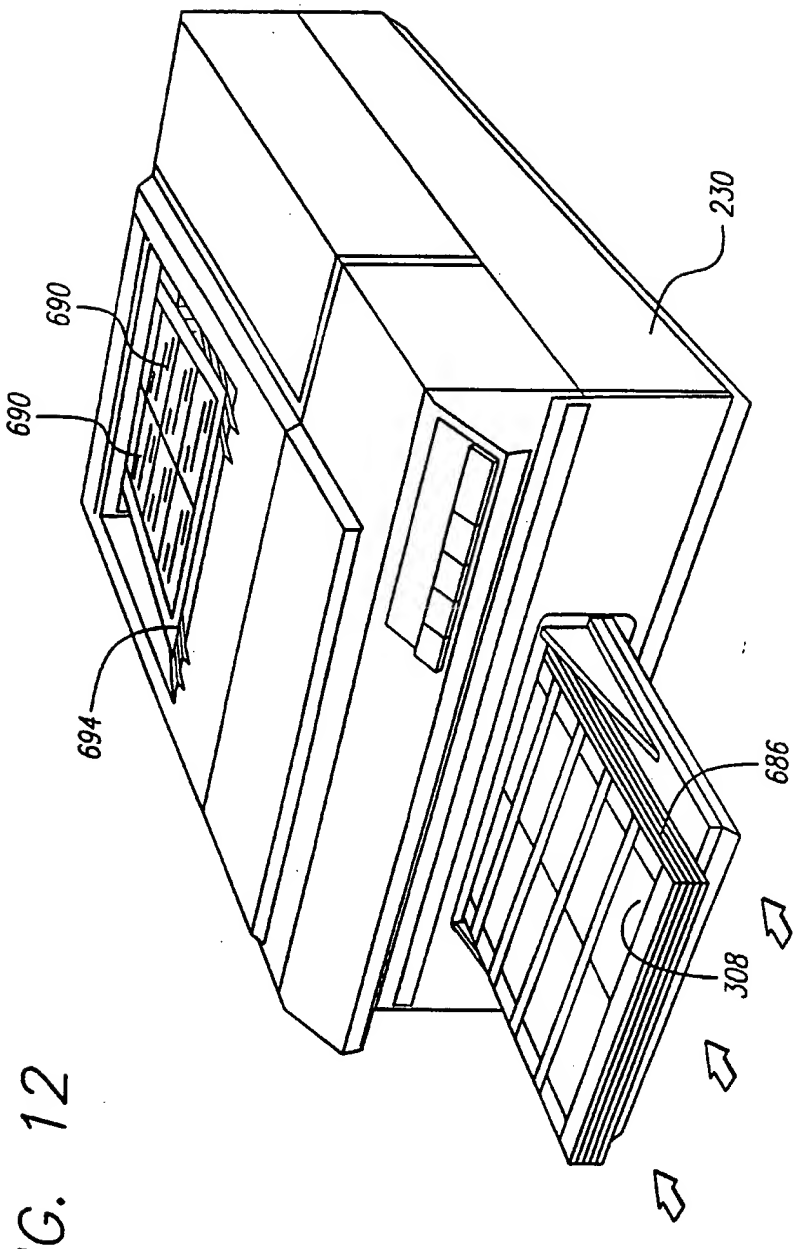


FIG. 12

FIG. 14

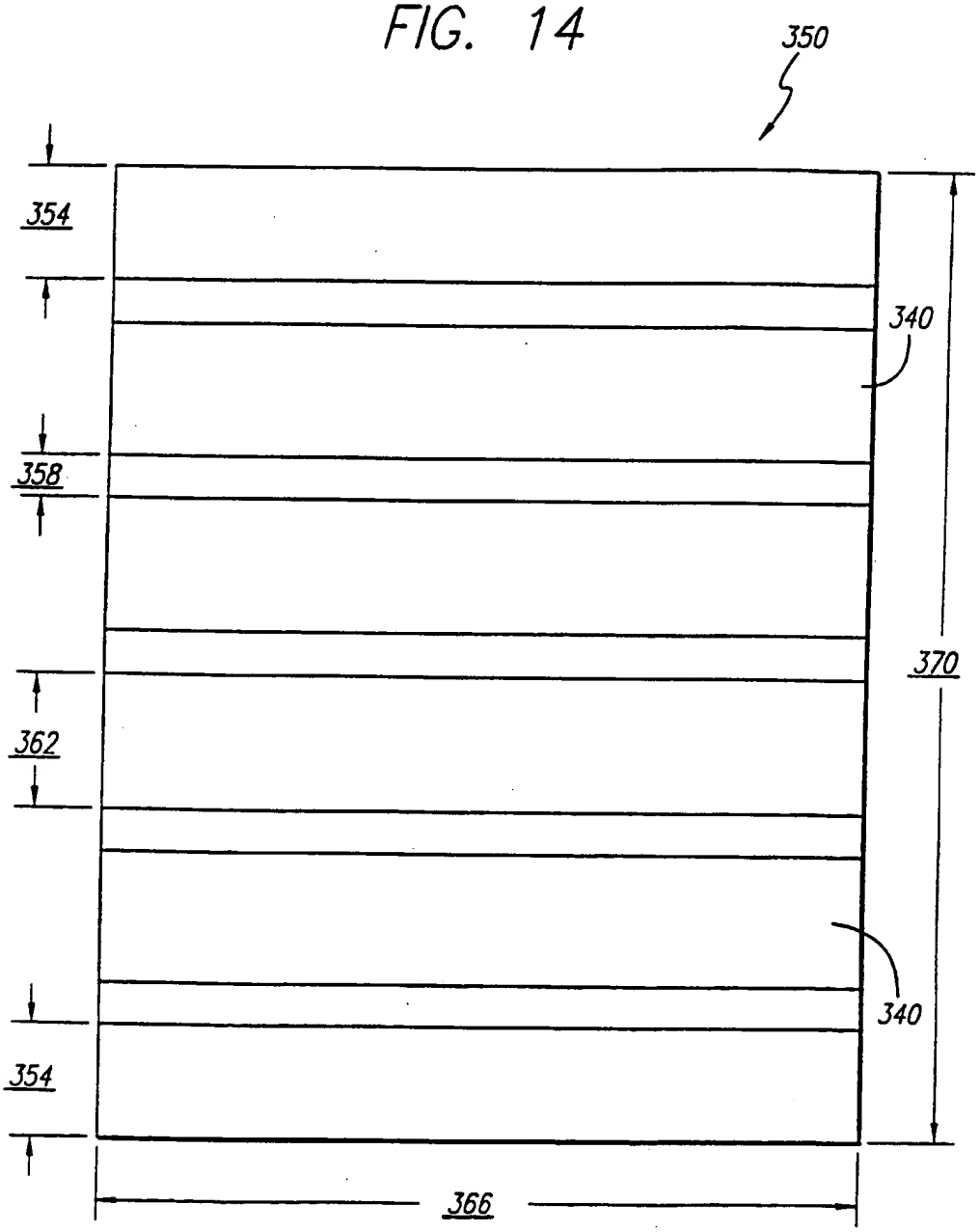


FIG. 15

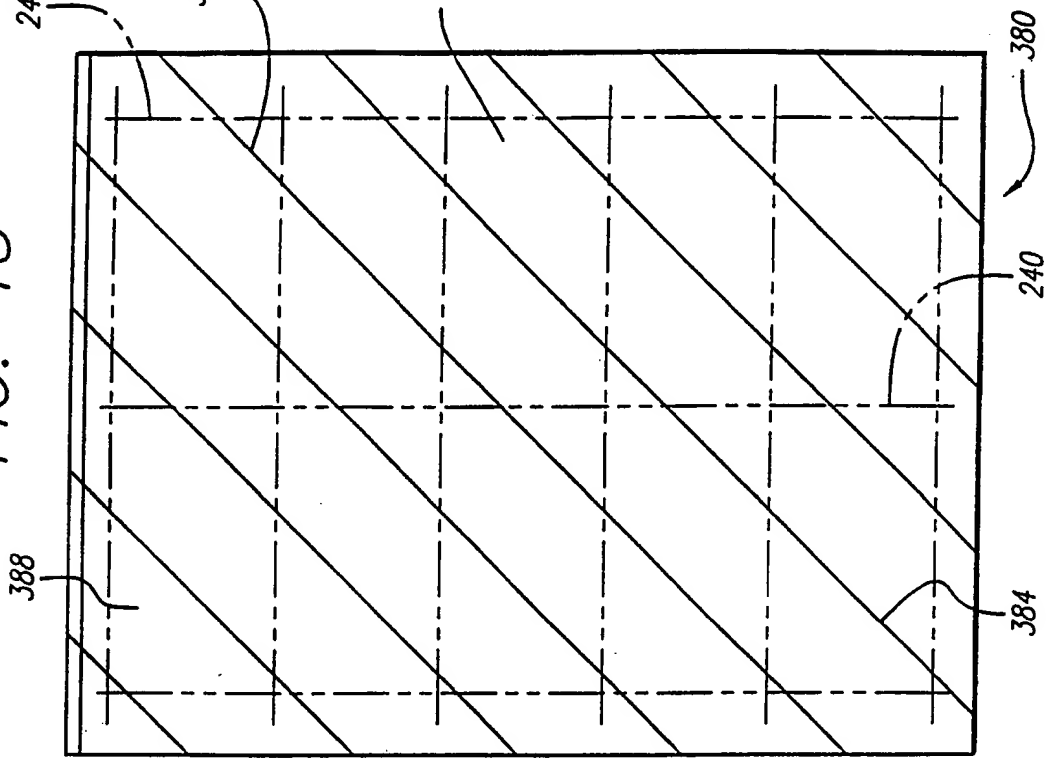
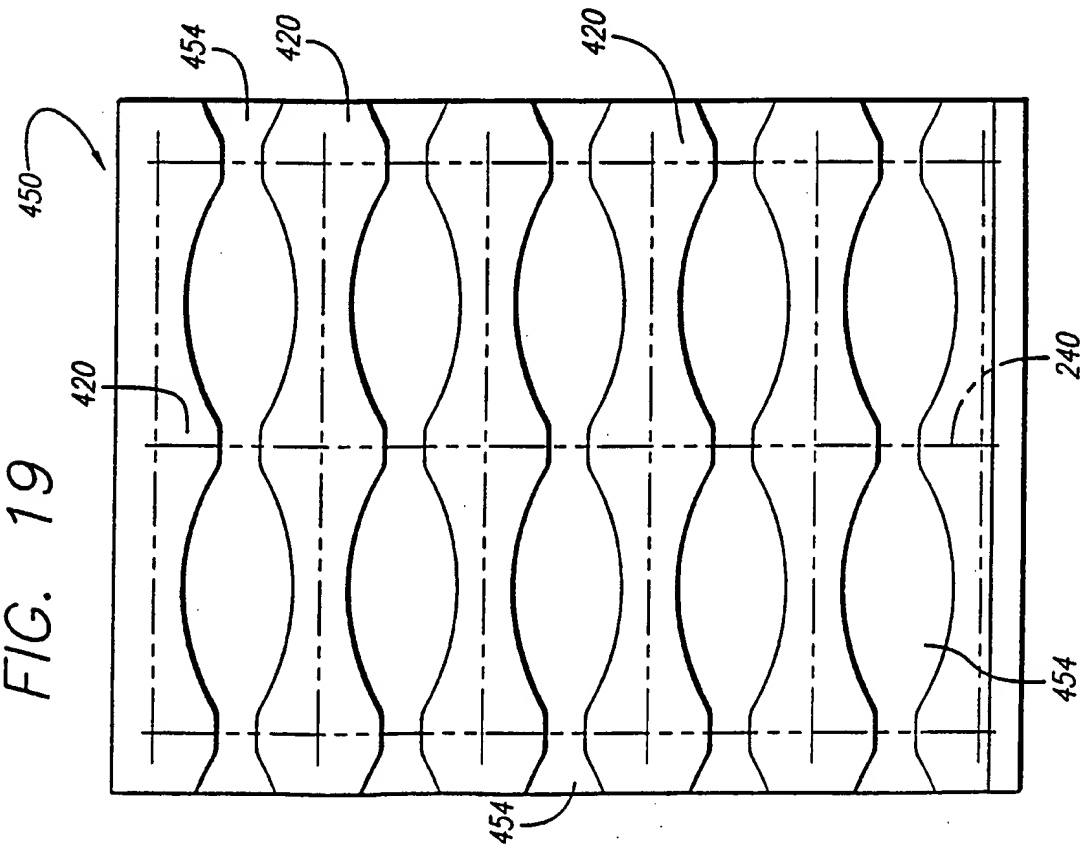


FIG. 19



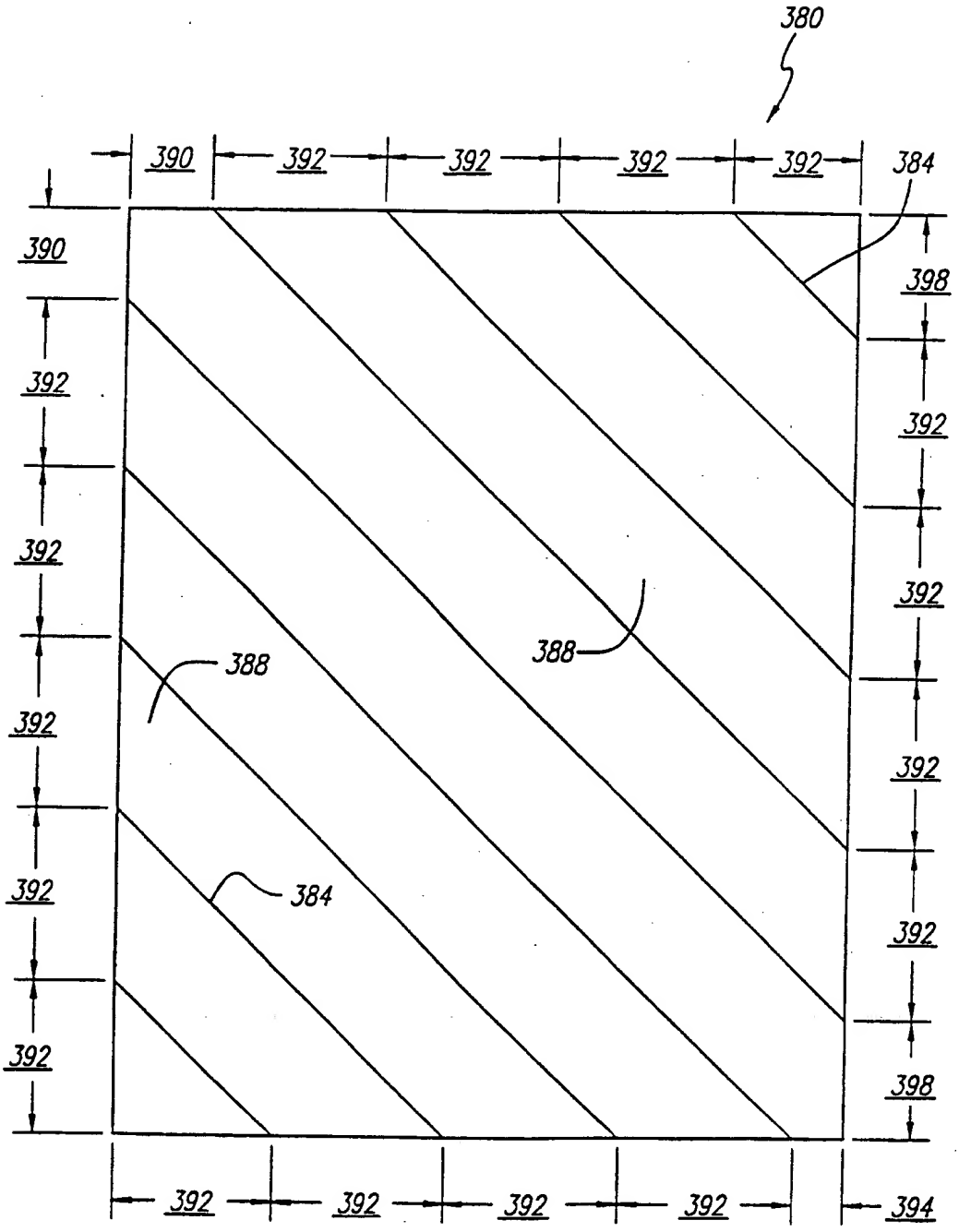

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FIG. 16

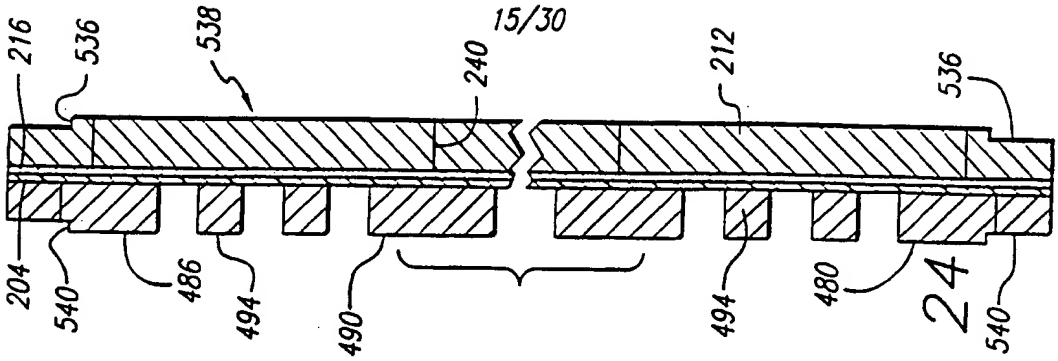

FIG. 23

FIG. 24

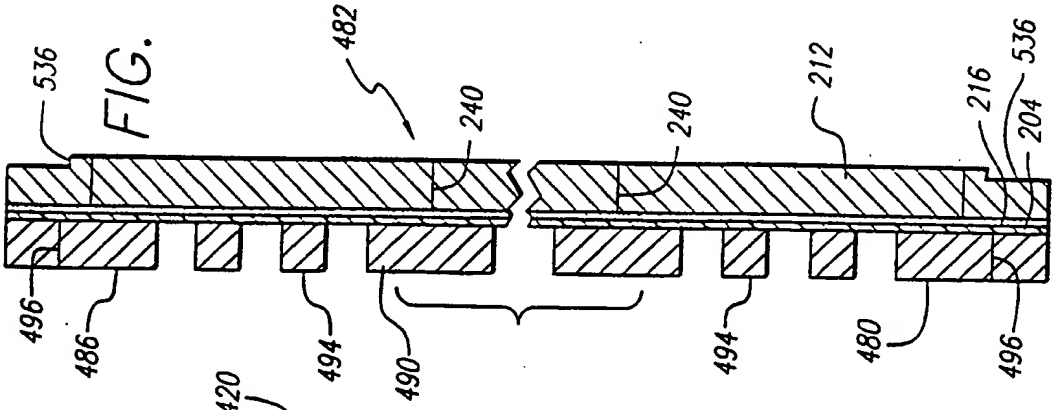

FIG. 17

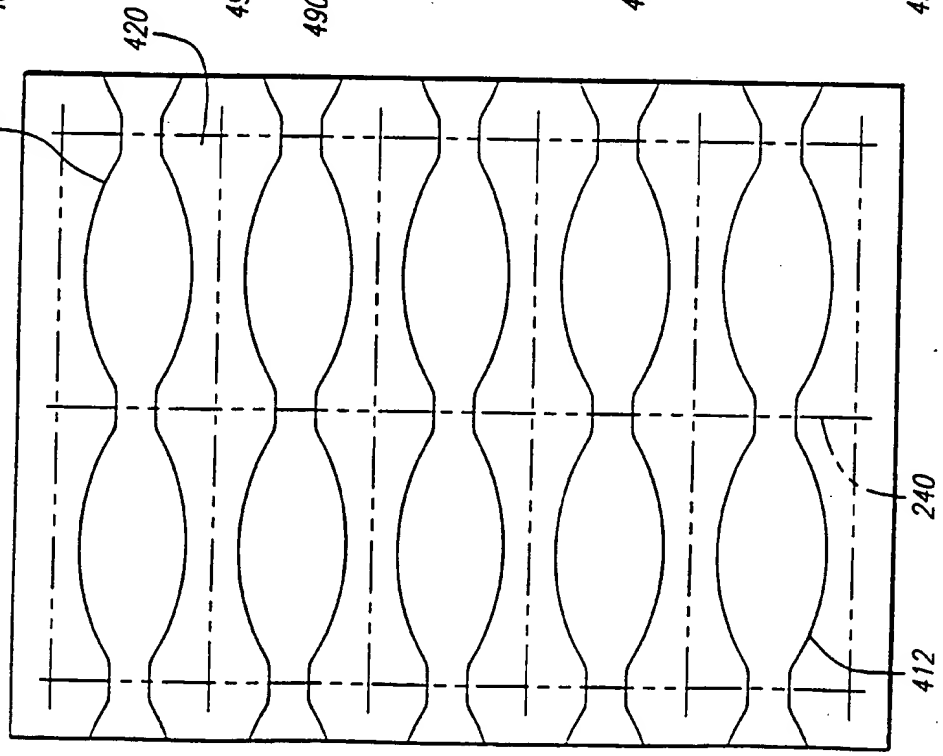

FIG. 18

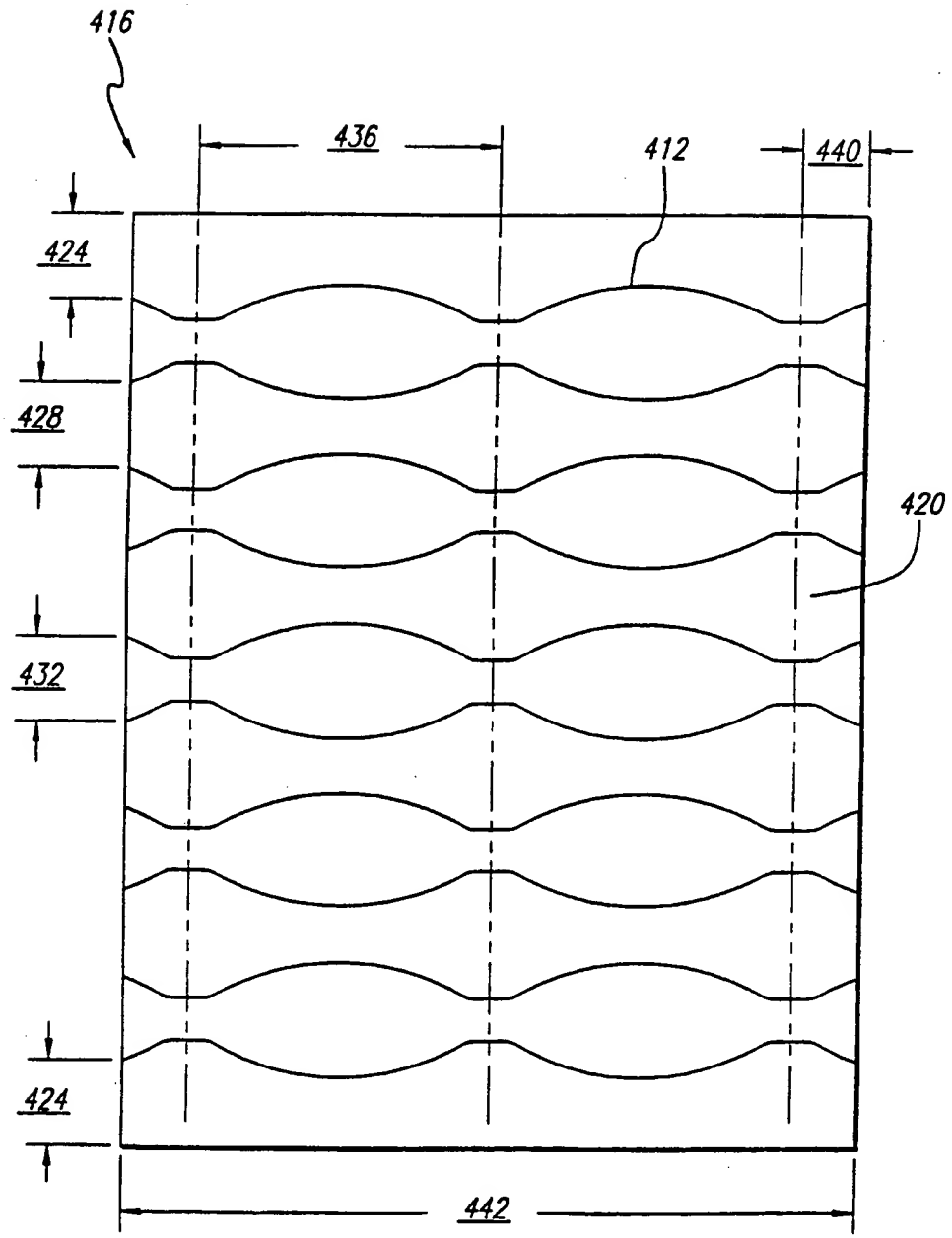

FIG. 20

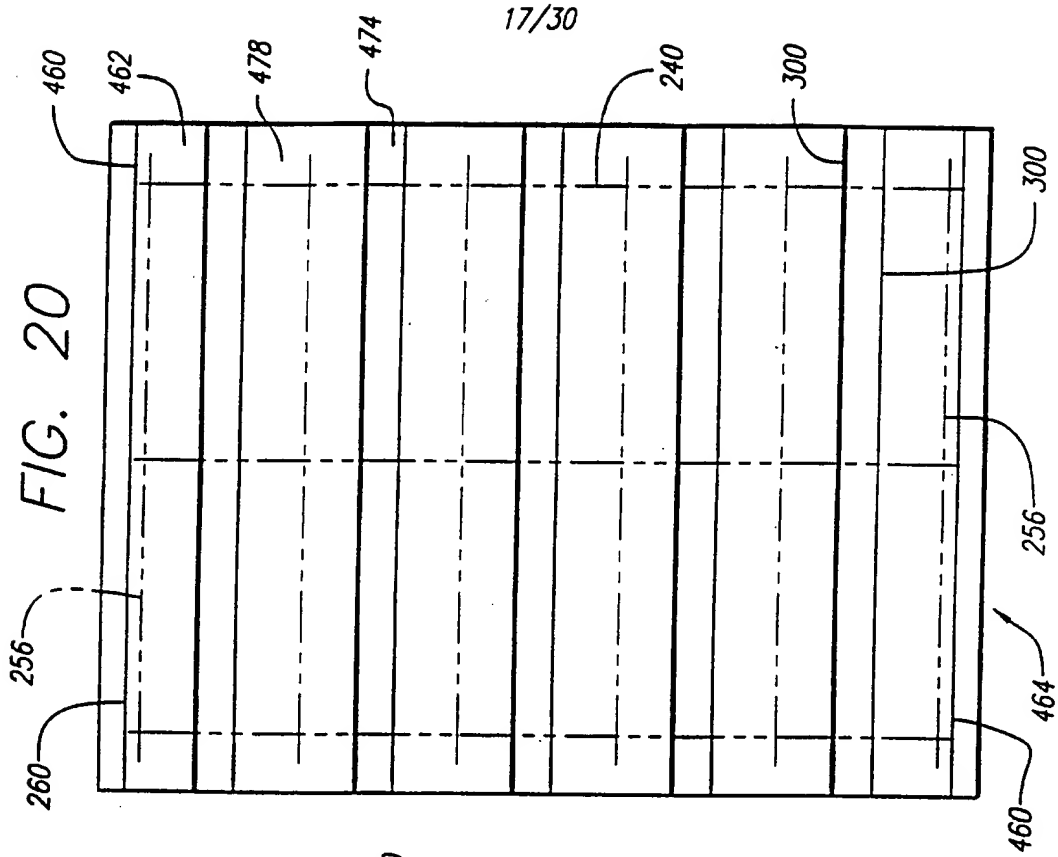
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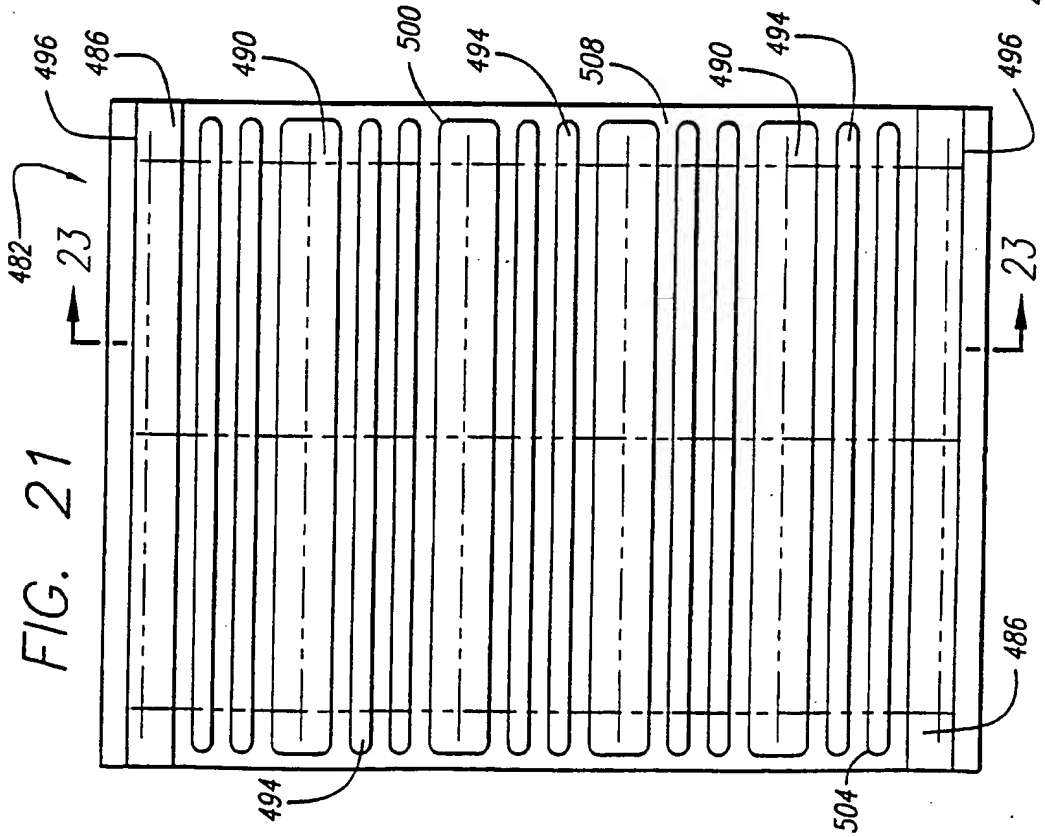
FIG. 21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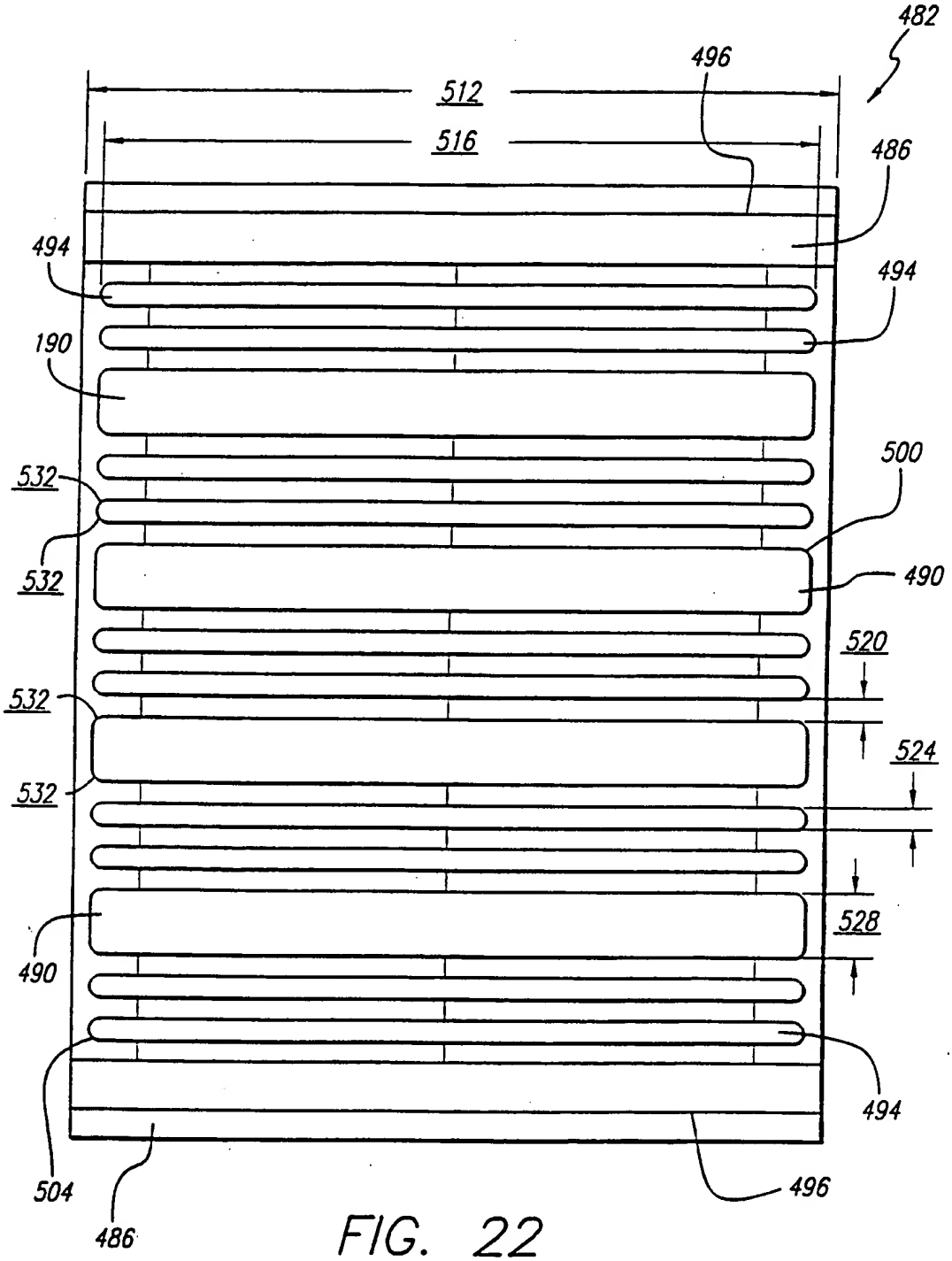
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FIG. 22

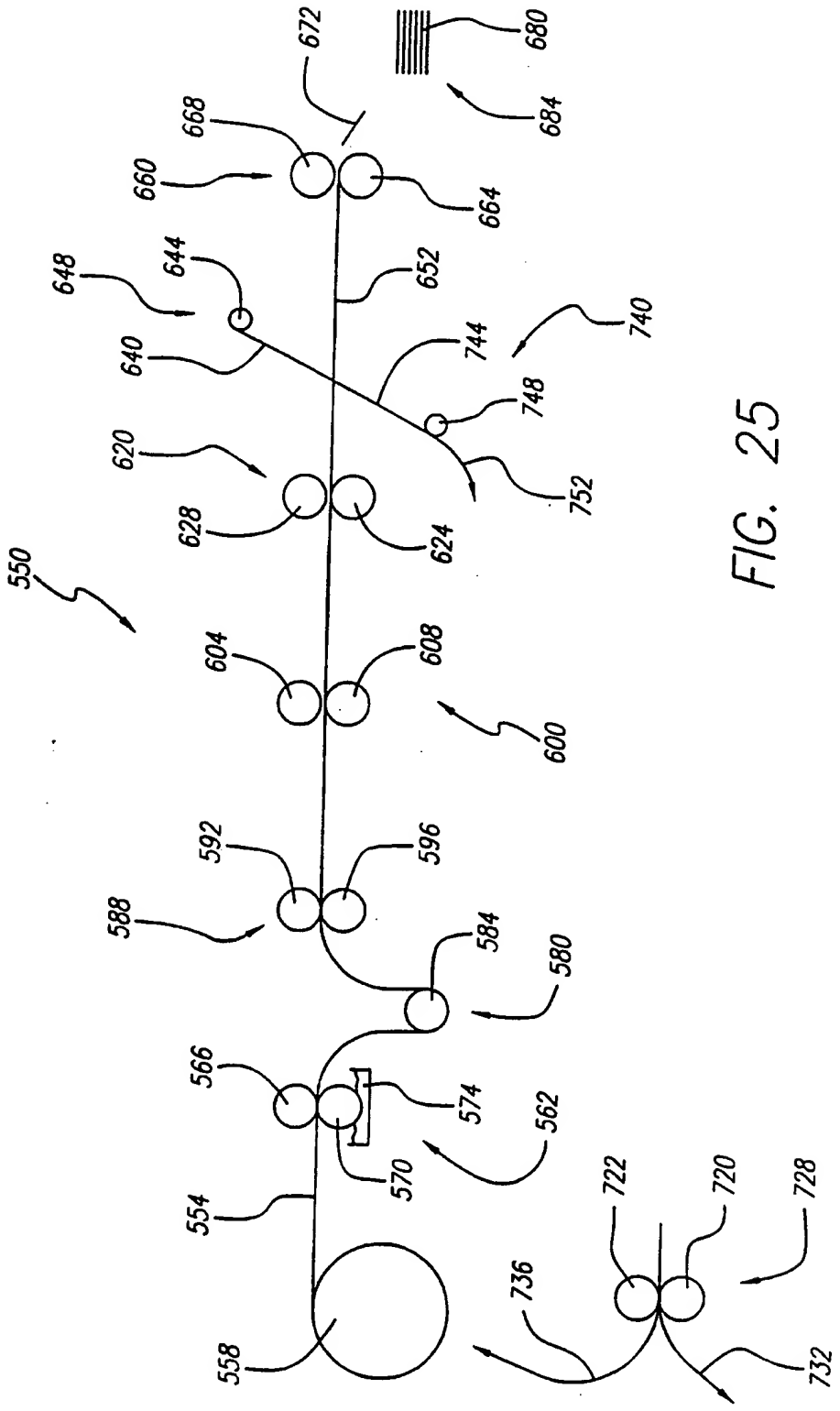
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FIG. 25

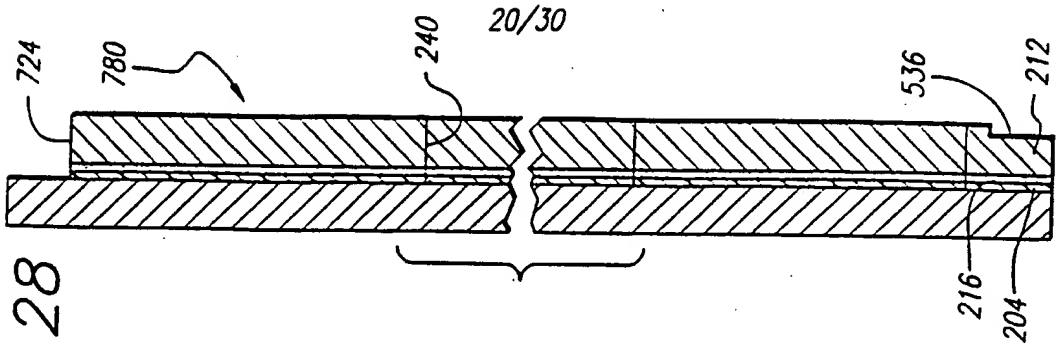


FIG. 28

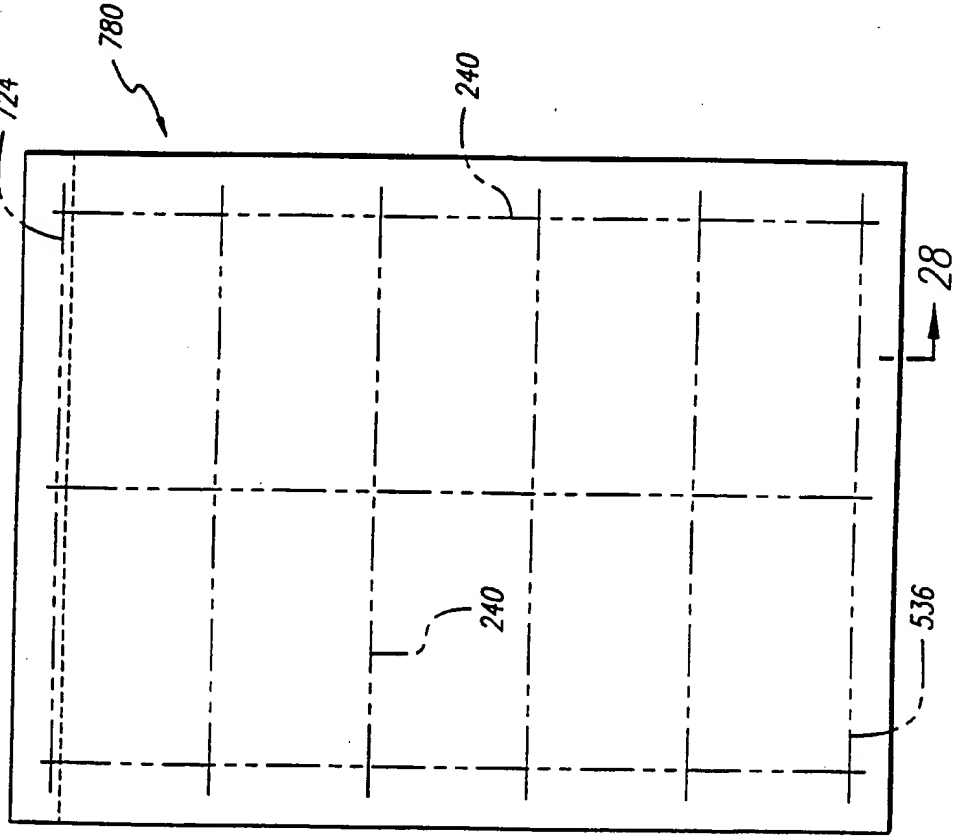
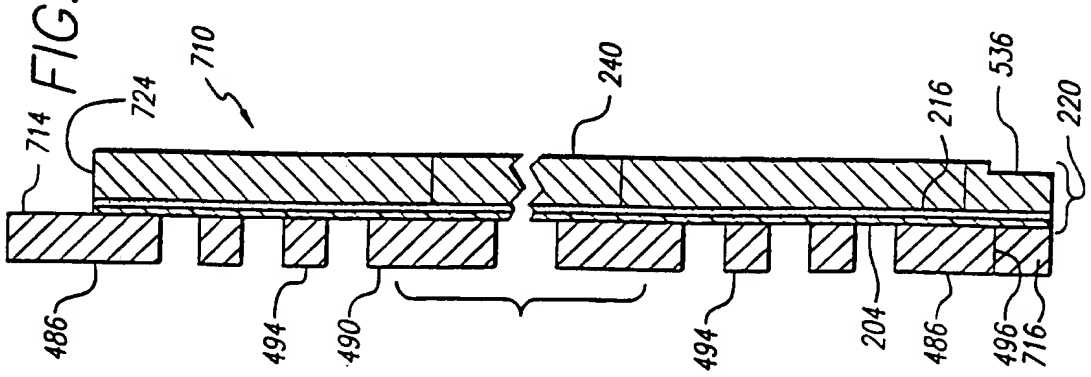


FIG. 27

FIG. 26



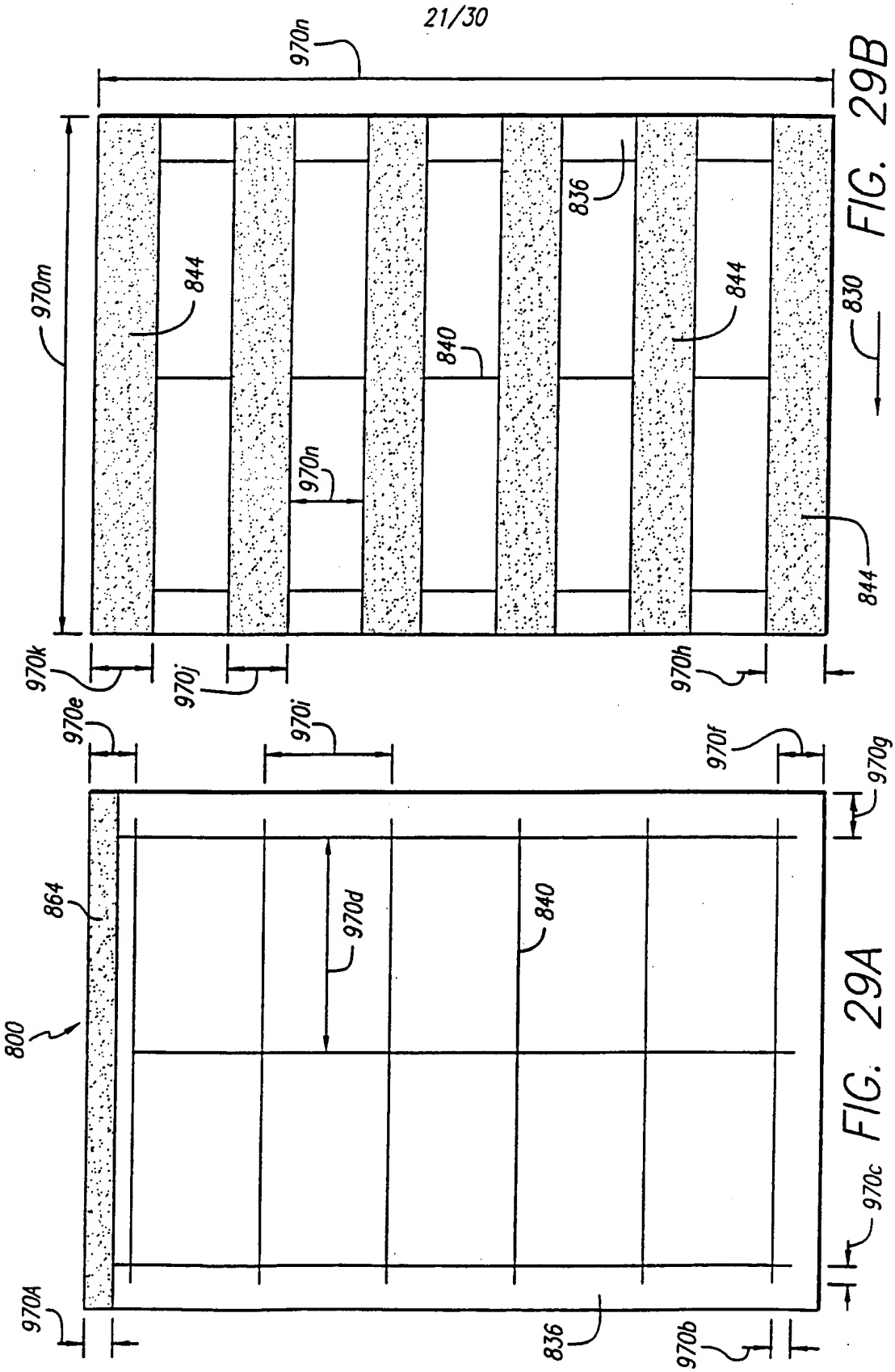


FIG. 29B

FIG. 29A

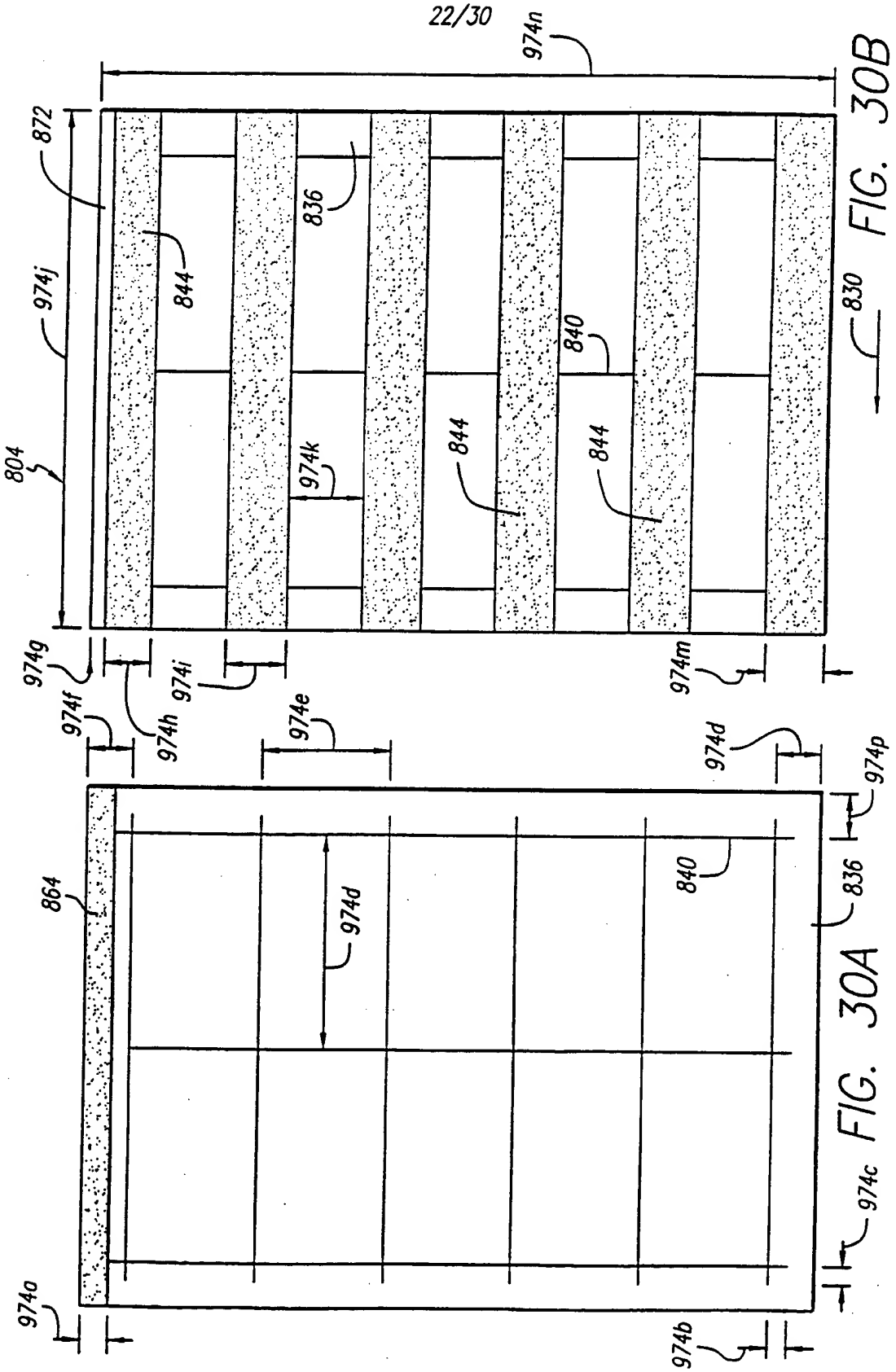


FIG. 30B

FIG. 30A

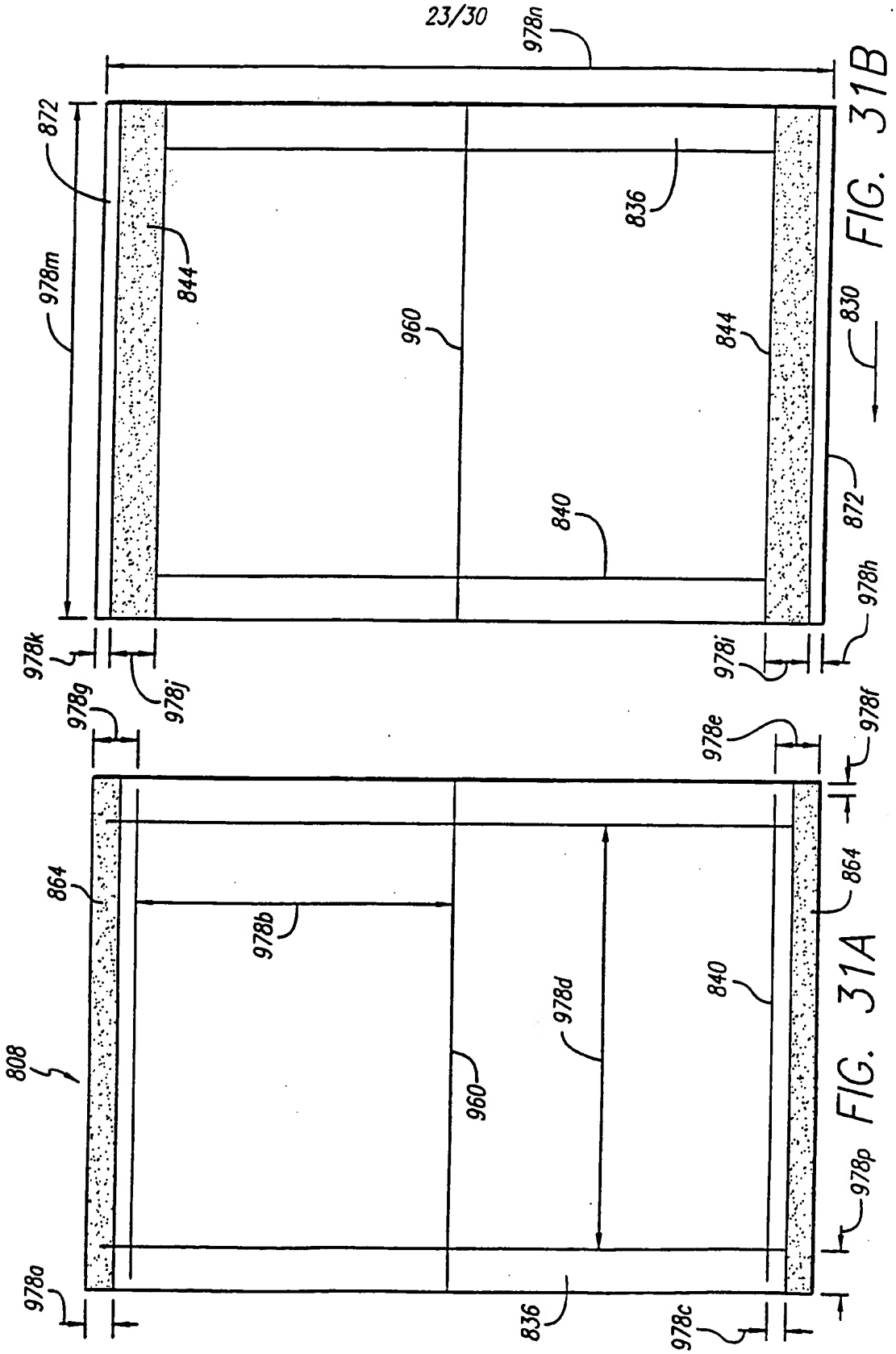


FIG. 31B

FIG. 31A

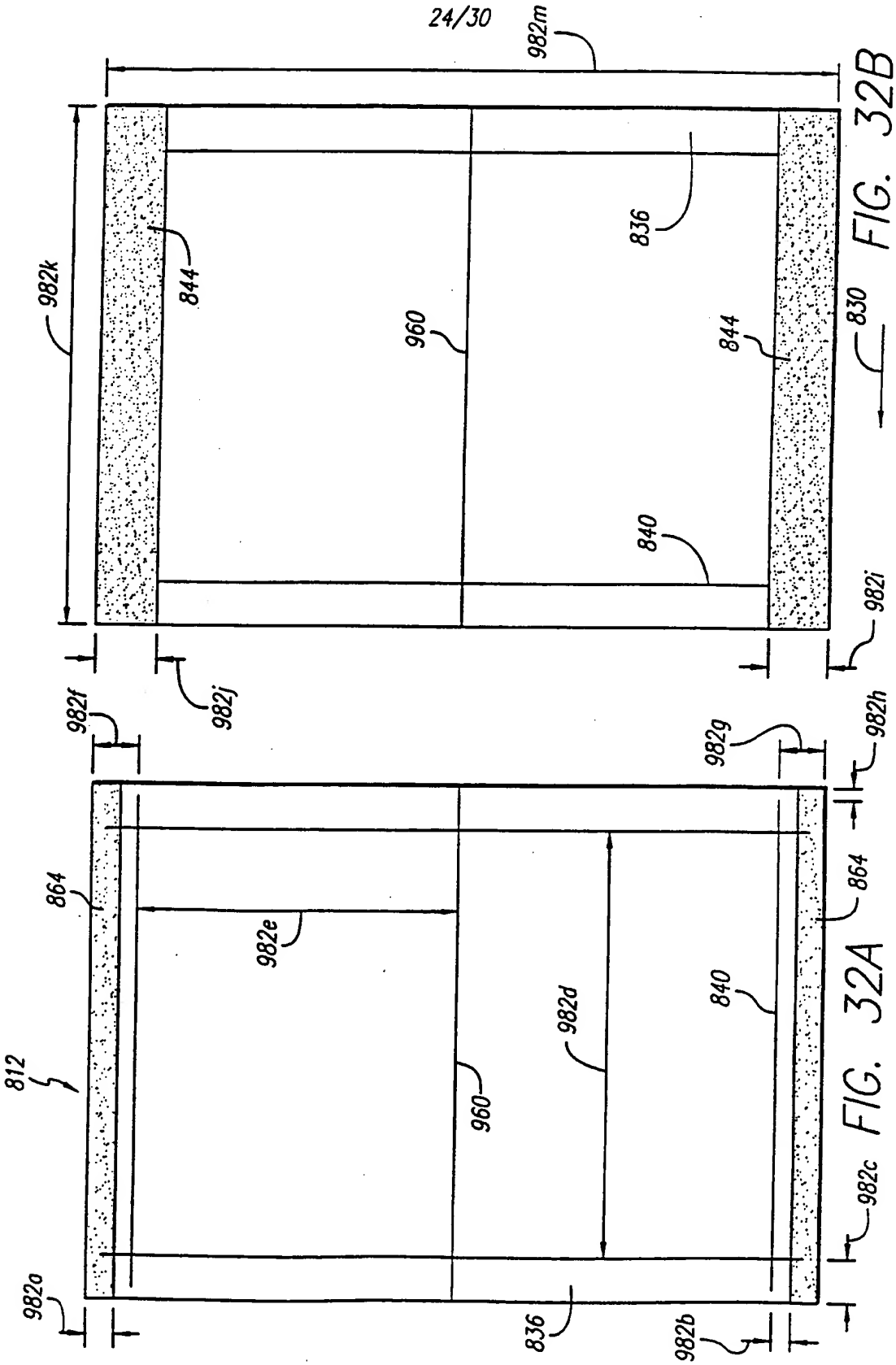


FIG. 32B

FIG. 32A

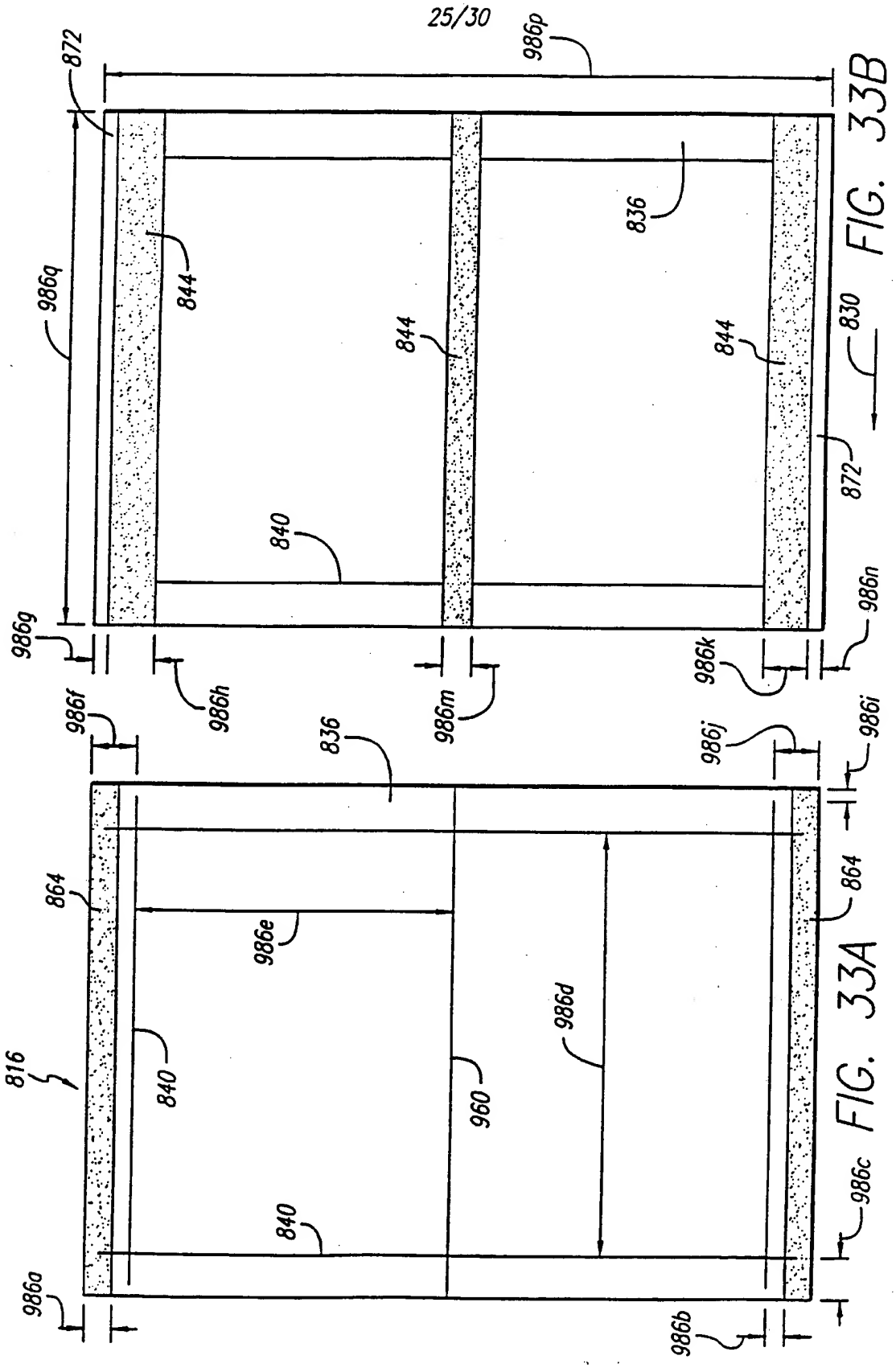


FIG. 33B

FIG. 33A

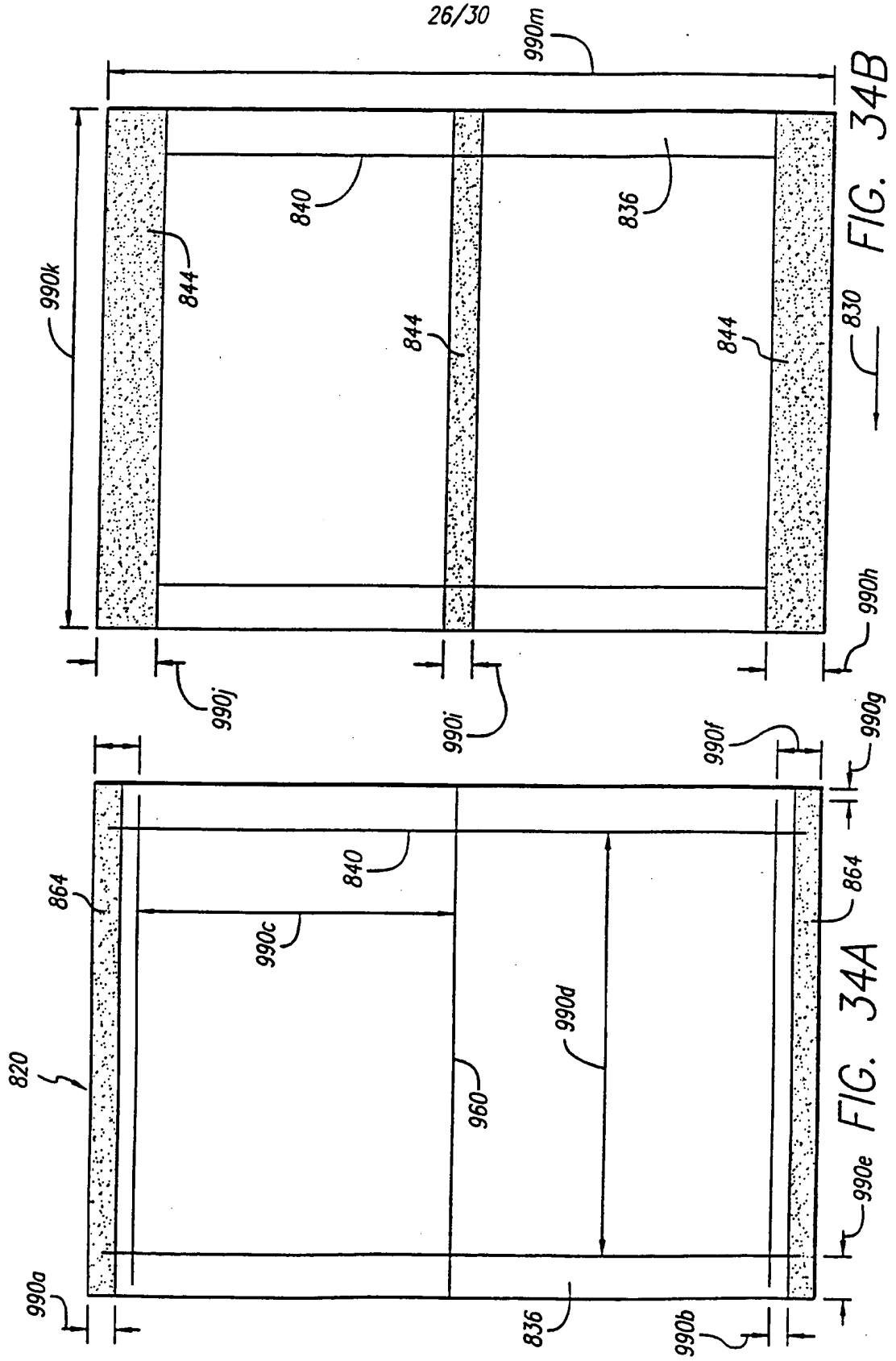


FIG. 34B

FIG. 34A

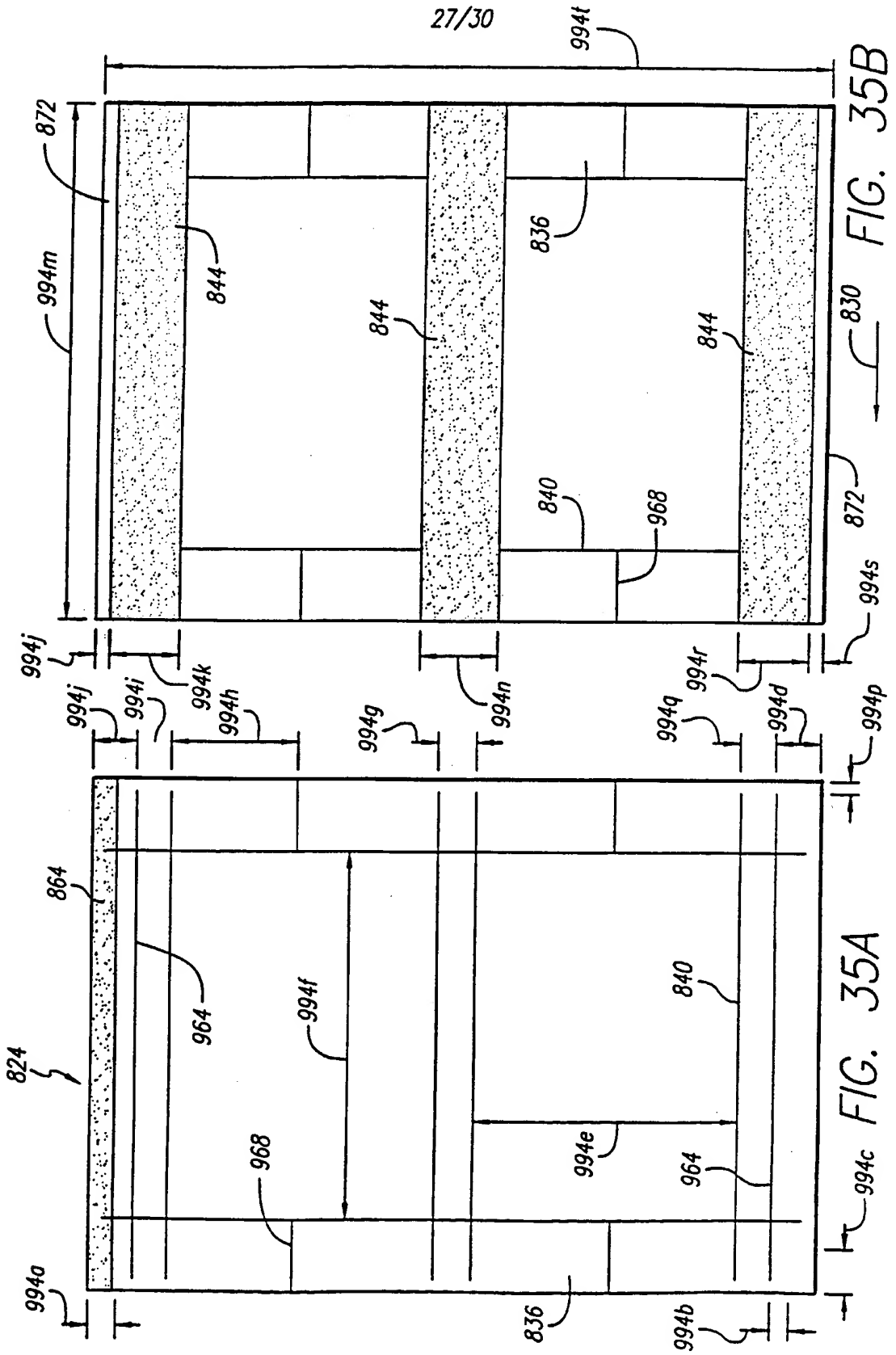


FIG. 35B

FIG. 35A

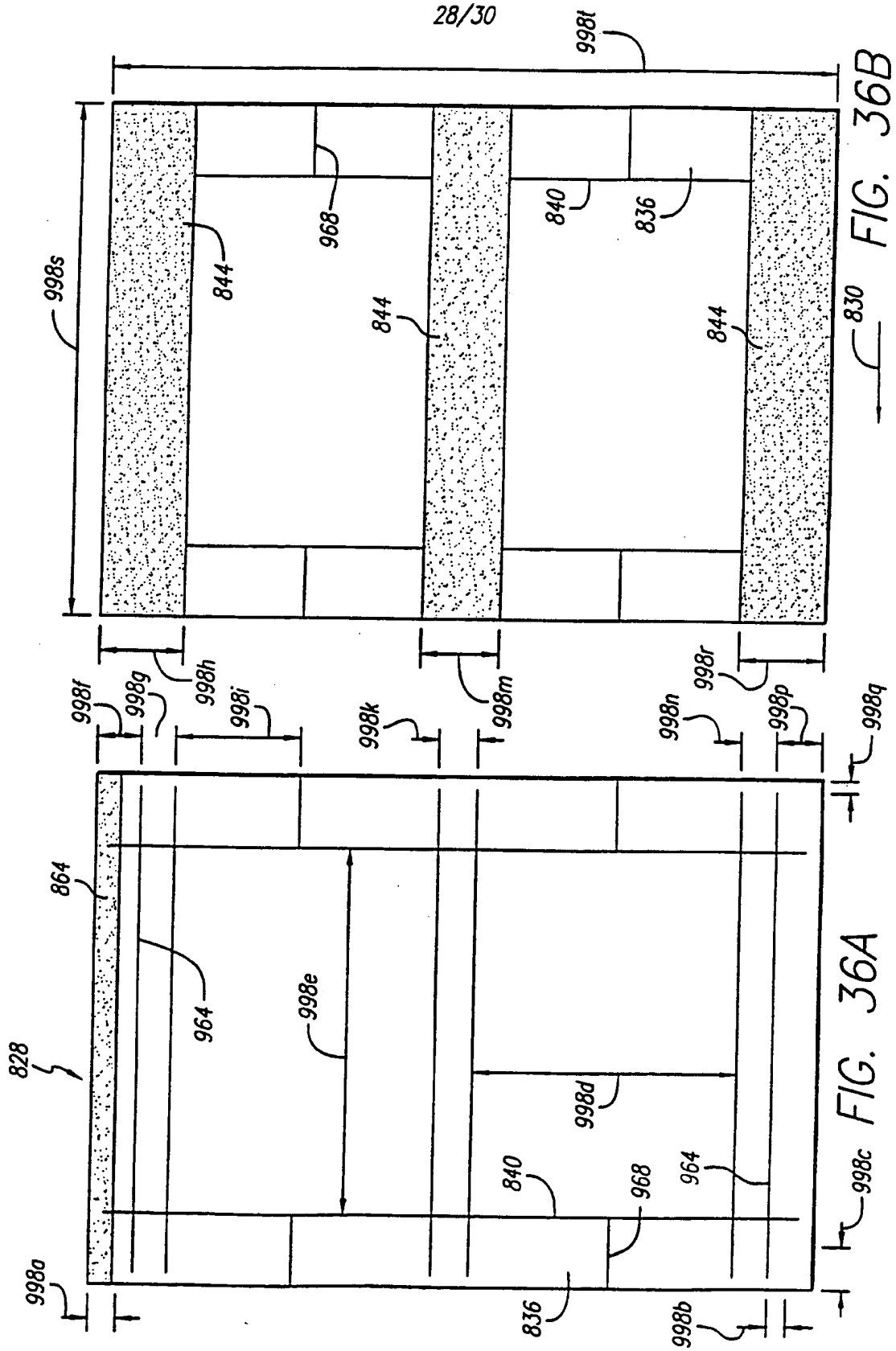


FIG. 36B

FIG. 36A

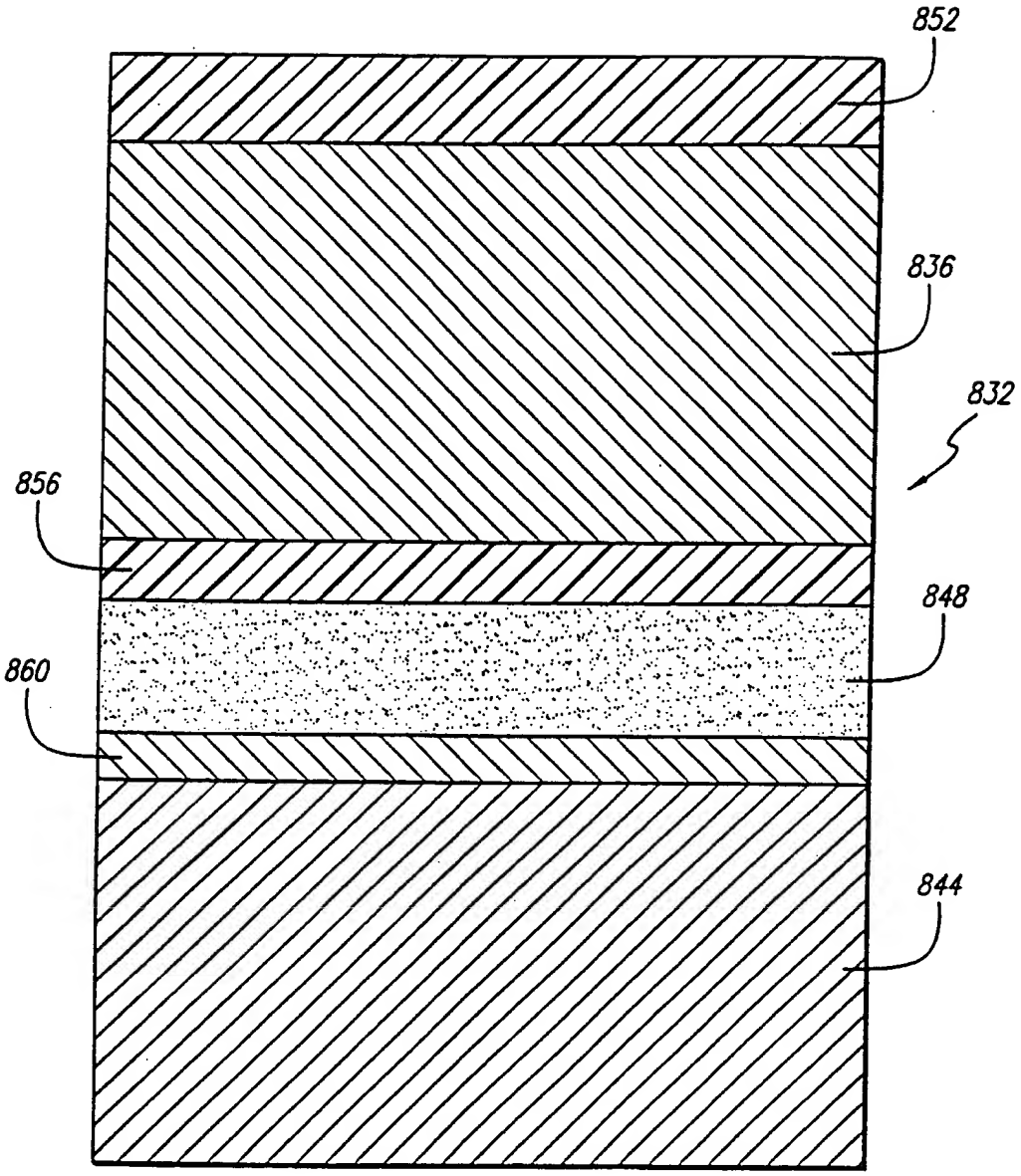


FIG. 37

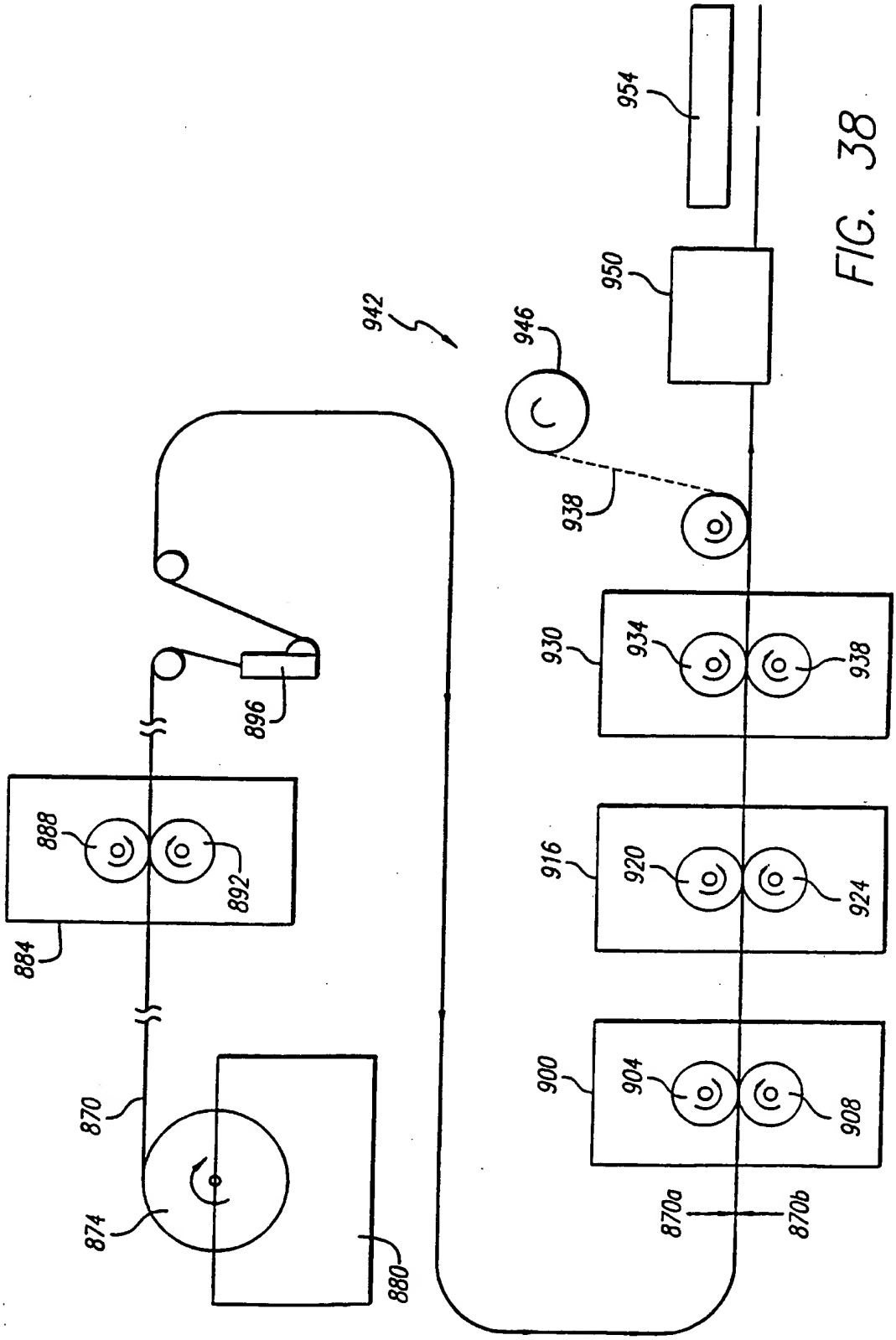

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FIG. 38

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/21854

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :B32B 31/00
US CL :156/257, 259, 267, 268, 271, 277; 428/41.7, 41.8, 42.3, 213
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 156/257, 259, 267, 268, 271, 277; 428/41.7, 41.8, 42.3, 213

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,135,789 A (SCHMIDT) 04 August 1992, entire document.	1-182
Y	US 5,340,427 A (CUSACK et al) 23 August 1994, entire docuemnt.	1-182
Y	US 5,632,842 A (OLIVER et al) 27 May 1997, entire document.	1-182

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"O"	document referring to an oral disclosure, use, exhibition or other means		
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